FLIGHT
The AIRCRAFT ENGINEER & AIRSHIPS

First Aeronautical Weekly in the World. Founded January, 1909

Founder and Editor : STANLEY SPOONER

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DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list—

1928

Dec. 3–8.... International Aeronautical Exhibition, Chicago, Ill.

Dec. 12–14 International Conference on Aviation, Washington, U.S.A.

Dec. 17.... R.Ae.S. Dinner to Mr. Orville Wright, at the South Kensington Science Museum

1929

May 21.... Northampton Air Pageant

July 13.... R.A.F. Display at Hendon

July 16–27 7th International Aero Exhibition, Olympia

Oct. 31.... Guggenheim Safe-Aircraft Competition Closes

EDITORIAL COMMENT

IN the Private Flying section of FLIGHT this week reference is made to the possibility that a seaplane club may be established in the spring at an East Coast yachting centre. The moving spirit in the new scheme is Maj. Holmes, the hon. secretary of the Suffolk and Eastern Counties Aeroplane Club, and FLIGHT, accused as "the Seaplane Paper," can only wish the enterprise every possible success. In the article dealing with the subject our contributor refers mainly to the appeal of seaplane flying as a sport, but there is another and wider aspect which should be kept well in mind. In April of next year, or so it is hoped, Great Britain will at long last begin to operate a really worth while flying-boat service over the Mediterranean, and one hopes that this will be but a beginning of Imperial seaplane routes all over the British Empire. The question inevitably arises : How are we to ensure that trained personnel for our commercial seaplanes is always available as and when required ?

A Seaplane Club ?

Although a good landplane pilot will probably fairly quickly learn to handle a seaplane, there is no gainsaying the fact that seaplane personnel does require a good deal of specialised training before becoming proficient in that seamanship to which Comdr. Maycock has frequently referred during discussions of lectures at the Royal Aeronautical Society. Quite apart from the actual taking off, flying and alighting of a seaplane, there is a lot to learn about winds and tides and their effect on the behaviour of seaplanes, and these things cannot be learned in five minutes. That a certain percentage of R.A.F. pilots will find their way into civil seaplane flying is to be expected, but if our commercial Empire seaplane routes develop to the extent hoped for, it will be necessary to augment the personnel, and here we believe that seaplane clubs could do a great deal of useful work in training not only pilots, but "ground" staffs also.

The question of personnel is, to our way of thinking, one of the very greatest importance, and should be given the fullest consideration by the authorities,

with Empire requirements kept prominently in view. When, therefore, it comes to a question of assistance, surely a properly organised seaplane club should be entitled to quite special consideration.

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Aircraft Production Problems

With the major portion of the paper on aircraft production read by Mr. F. Sigrist before the Royal Aeronautical Society on November 29, it is not proposed to deal here. The nature of the paper was such that it can best be summarised in the AIRCRAFT ENGINEER (Technical Supplement to FLIGHT), and this it is proposed to do. Mr. Sigrist, however, mentioned in the course of his paper certain aspects of the problem of production which deserve the widest possible attention. It should be superfluous for us to inform readers of FLIGHT that Mr. Sigrist is one of the pioneers of British aircraft constructors, having been associated with Mr. Sopwith since the very early days, and having had unique experience of the very subject on which he lectured: the works side of aircraft production. Mr. Sigrist is one of those men whom no amount of theorising can convince against their better judgment, and his practical commonsense views are proverbial in the industry. The world in general is totally unaware how much of the phenomenal success of the Sopwith machines during the war was due to Mr. Sigrist's practical mind. When, therefore, he speaks on his own particular pet subject he is entitled to be listened to not only with attention, but with a great deal of respect.

The aspects of Mr. Sigrist's lecture to which we would refer here dealt with the broader problems involved in aircraft production, and the first of these related to the fitful way in which orders are given out by the Air Ministry. "It is an economic axiom," Mr. Sigrist said, "that the full benefits of output are only realised when there is a steady flow of work over a period. Owing to the vagaries of the Air Ministry, bad luck, dud engines or unforeseen circumstances, according to individual opinion, the unfortunate constructor is seldom able to benefit by such a period. For six or nine months he may be very busy, even working overtime, and then finds a sudden slump. In other words, his year is made up of high peaks and depressions, a factor which bears an important relation, among other things, to the price question."

This is a subject of quite fundamental importance, and is one with which the aircraft industry is constantly faced. It is no exaggeration to say that a similar condition is not met with in any other industry, and it is doubtful whether any other industry could manage to survive such a condition. We have pleaded repeatedly in FLIGHT for a review of the position, and for an examination of the problem of distributing more evenly, and over a longer period, the orders for aircraft. It used to be argued that developments were so rapid that it would be dangerous to arrange for a distribution over two or three years of orders so as to ensure a steady flow. That was doubtless true some years ago, but we very much doubt whether it is equally true to-day. Design is beginning to reach a routine stage, and it is frequently found that when a certain Air Ministry specification is issued, and machines built to it by a number of constructors, there is so little to choose between the various machines that it could not possibly matter a very great deal to the efficiency of the R.A.F. which type was ordered. That seems rather to indicate that the risk of hindering progress by issuing orders in a less spasmodic way than is done at present is nothing like as great as it used to be.

Another very important point raised by Mr. Sigrist was the question of production in an emergency. He recalled that it is common knowledge that the staff view of aerial warfare is that in the first clash of hostilities casualties in machines and personnel will be heavy, and that the side which can most rapidly re-equip will be the predominant party. In other words, the industry must be in a position to assume the rôle of a third line of defence. "*Frankly,*" Mr. Sigrist said, "*We cannot accept this to-day, and until we are on a basis which ensures continuity of output and obviates the high peaks and depressions which are now prevalent, the position will still be serious.* Imagine a sudden call under present conditions—a call for, let us say, one hundred varied machines within seven days, or even fourteen. The chance of more than a 30 per cent. response is remote. Let us go further. How soon could we attain an increasing output up to two hundred machines per week? Consider the material position—and the possible area of hostilities—and it will be a difficult question to answer. We cannot expand immediately, neither can we find sufficient men to instruct allied trades which might be of assistance. Even if we did manage to produce the machines, the engine question would still remain, and in its way seems less capable of solution than the aircraft problem.

"I realise that political and economic factors, and a natural hesitancy to undertake extensive commitments in face of rapid advancement of the science of aerodynamics and engines must be largely responsible for the Air Ministry production programme, and whilst I sympathise with them in their difficulties, I rather feel that the subject has not received the consideration which its importance merits."

We do not think the matter has ever been put more concisely, and Mr. Sigrist's views will be shared not only by all members of the aircraft industry (who might be accused of being prejudiced) but by all who have ever given the subject serious consideration.

It all seems to boil down to this: Which is likely to be the better policy, to aim at super-efficiency at the cost of being unable to expand at a time of emergency, or to be satisfied with a little less efficiency and to have at any rate a chance of being able to go suddenly and rapidly into mass production on a scale sufficient to meet our requirements? At the moment it would certainly appear that the existing equipment of the R.A.F. would not last many weeks in an emergency. Is it safe to count upon no such emergency arising until we have had time to re-consider the whole problem and to plan our aircraft production on lines which would enable us to achieve the necessary expansion? We should hesitate to answer that question in the affirmative.

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Leicester Interested in a Flying Club

IN the annual report of the Council of the Leicester Chamber of Commerce, it states that steps must be taken towards the formation of a flying club. During the year, the question of civil aviation in relationship to the town has been considered.

FLIGHT
THE AIRCRAFT ENGINEER AND AIRSHIP

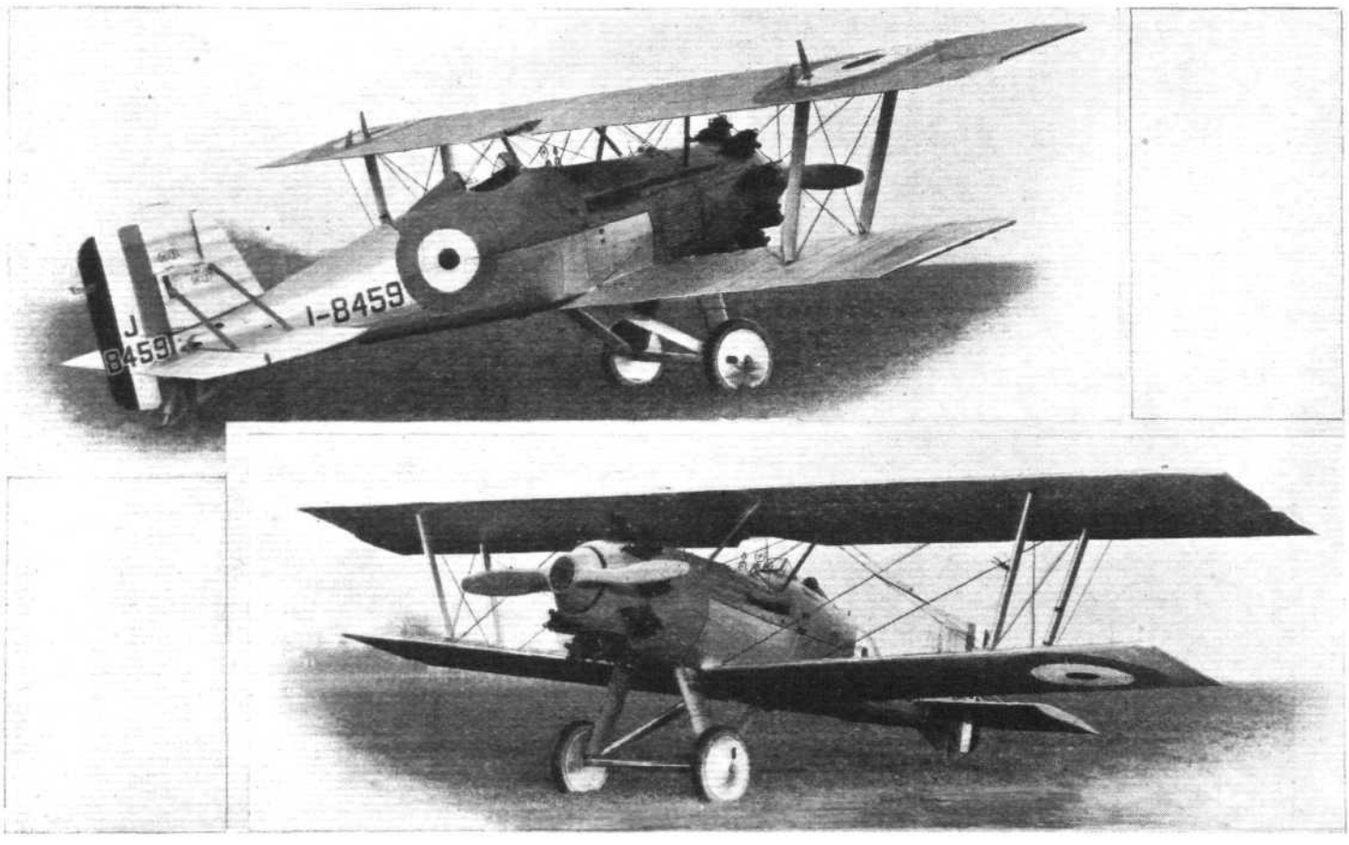
THE BOULTON AND PAUL "PARTRIDGE"

All-Metal Single-Seater Fighter

THE forms of metal construction developed by Boulton & Paul, Ltd., during the last six or seven years, are probably fairly well known to readers of FLIGHT. Less known is, probably, the fact that a large number of parts have been standardised by a very ingenious system in such a manner that, to take but one example, a steel spar for aircraft, ranging in size from the single-seater fighter to a twin-engined bomber, can be produced from stock. In the "Partridge," illustrated this week, very extensive use has been made of such standardised parts, with the result that the machine could, should the occasion arise, be produced very rapidly and cheaply. That this has been achieved without sacrificing performance will be clear from the performance figures given at the end of these notes.

General Design

The "Partridge" is a tractor biplane of orthodox design as regards the general lay-out, having a top plane of larger span and chord than the lower plane. The wing section is a bi-convex one, presumably with a small travel of the centre of pressure. Great care has been taken in streamlining the fuselage, the carefully thought-out engine cowling being one of the obvious refinements.



THE BOULTON AND PAUL "PARTRIDGE": These two views show the first machine. In the second, ailerons will be fitted to both planes. The engine is a Bristol "Jupiter" Series VII supercharged.

Constructional Features

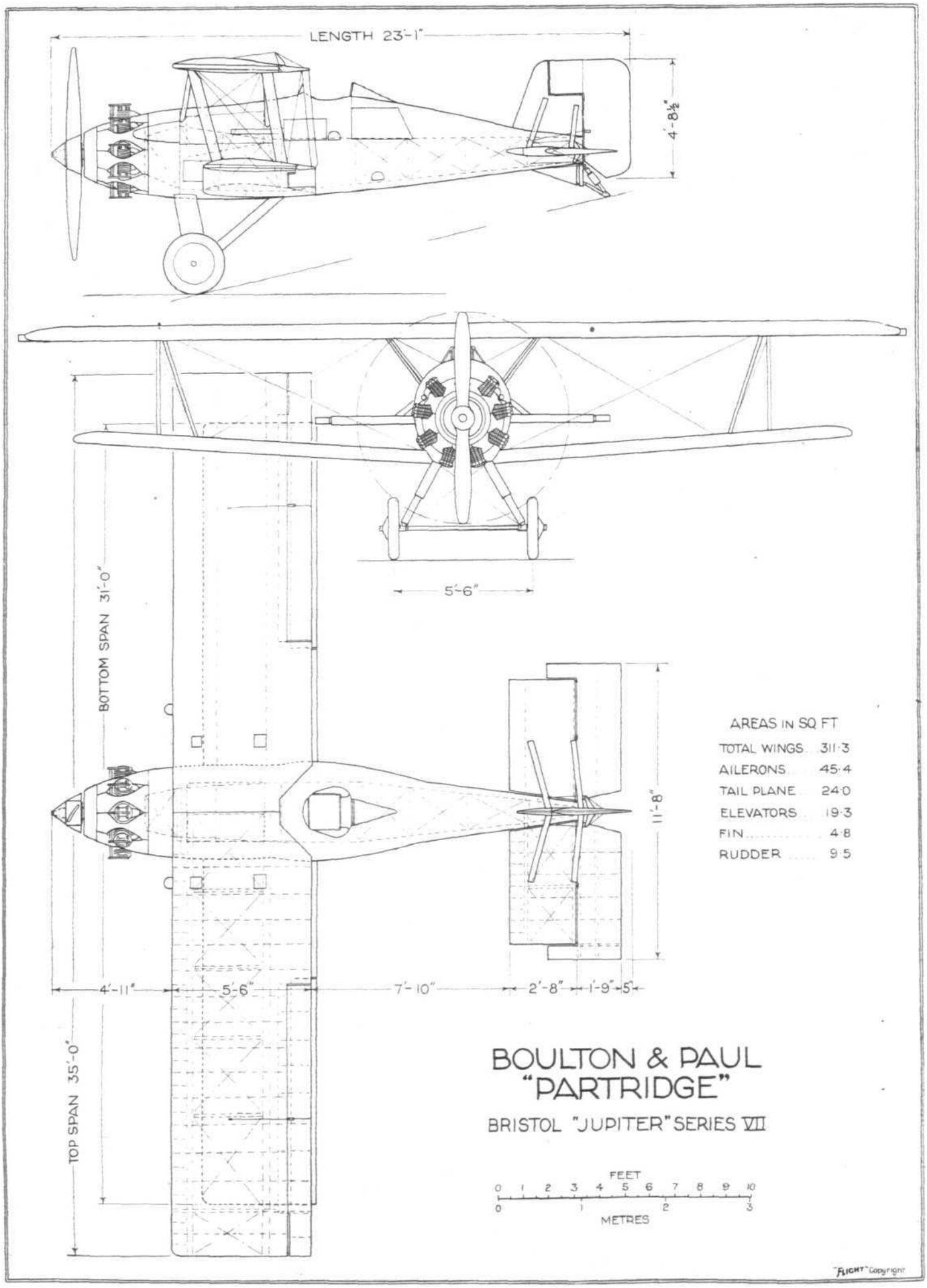
It is, however, in the constructional details that the "Partridge" is particularly interesting, and by the courtesy of Boulton & Paul, Ltd., we are able to illustrate these very fully.

The Fuselage.—The fuselage frame, which is in two parts, a forward portion which carries wings, petrol and oil tanks, pilot, guns, etc., and a rear portion extending from the cockpit to the stern post, is of all-metal construction with exception of the covering. In the front portion of the fuselage the longerons are of high tensile solid-drawn steel tube of stock sizes. The top longerons in the bay occupied by the cockpit are of very large diameter tube, and form the sole support of the Vickers guns. By their great size and strength they also give exceptional stiffness to this bay, and afford good protection in the event of a crash. In the rear portion of the fuselage, the longerons are of the well-known "closed-joint" type of tube, manufactured from steel strip, which this firm has developed during recent years, and which is used so extensively in the rigid airship R.101. Stock sizes are used in the "Partridge."

The fuselage struts are of various types according to the location in the fuselage and the diameter-thickness ratio required. Solid drawn high-tensile steel tubes, Boulton & Paul closed-joint tubes in steel and Duralumin, and solid drawn Duralumin tubes are all employed. The sockets and end fittings are all of standard Boulton & Paul stock parts, and make use of the tubular magnesium pads which this firm uses so extensively. A sketch shows the standard arrangement found in the rear portion of the fuselage. In the front portion the joints are slightly different, particularly those which carry the front and rear wing spars. These also are illustrated by sketches, from which it will be seen that use is made of a light alloy sleeve and two high-tension steel discs. Bracing is by tie rods throughout with the exception of the side bays of the cockpit, which are braced by diagonal tubes.

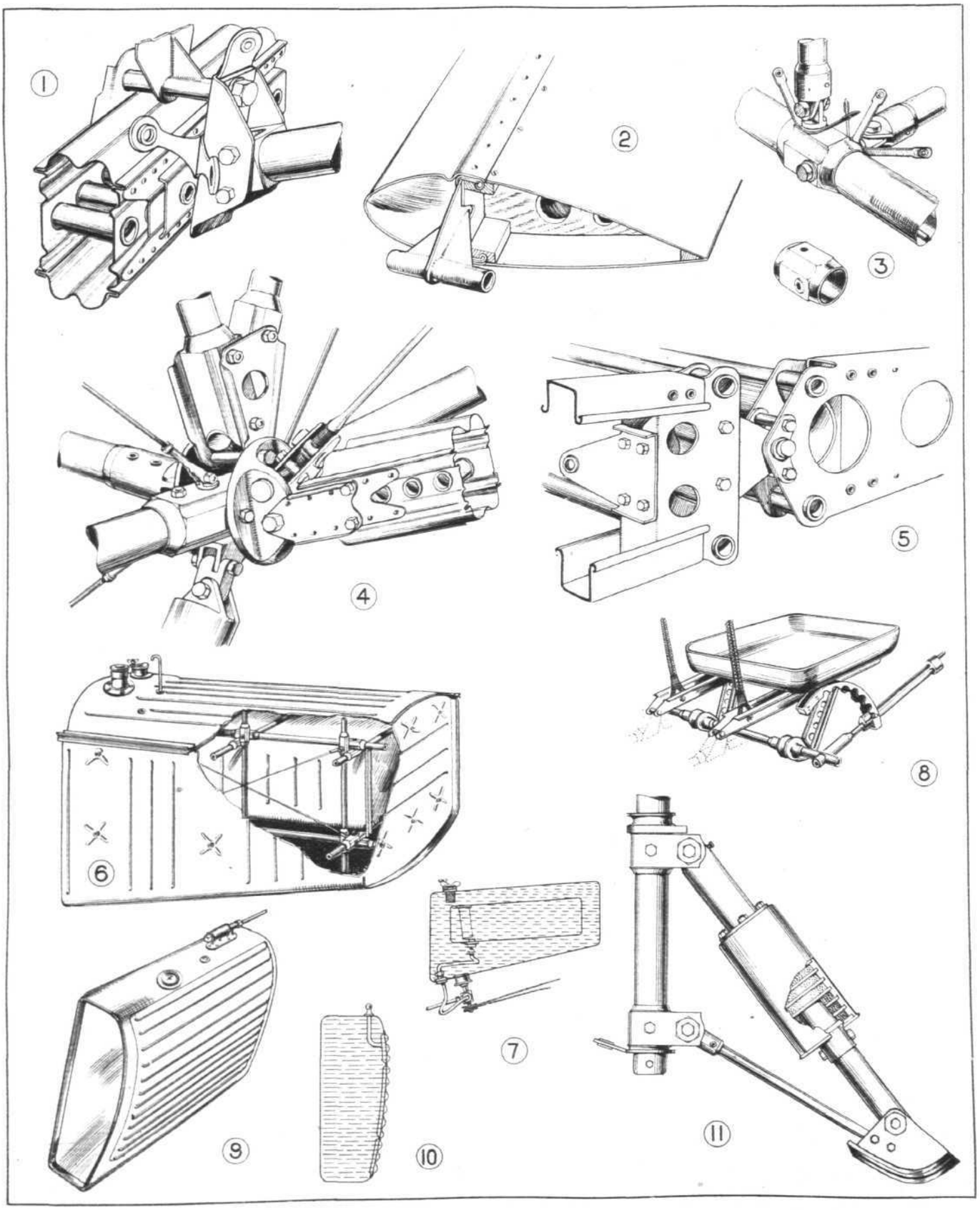
Great attention has been paid to the fairing of the fuselage in order to obtain as far as possible an unbroken streamline. With the exception of the gun tunnels, which are of sheet steel, the construction of the fairing is carried out in wood and fabric. Doors of adequate size are provided for access to wireless crate, guns, ammunition boxes, oxygen cylinders, petrol filter, instruments, etc.

Wings.—As already mentioned, the wings of the "Partridge" are of biplane formation, and in the second machine ailerons of the "Frise" type will be fitted to both top and bottom planes, as indicated in the general arrangement drawings. The wing tips are kept square in order to retain simplicity of construction. It is thought that the square type of wing tip used is as efficient aerodynamically as would be a rounded tip.



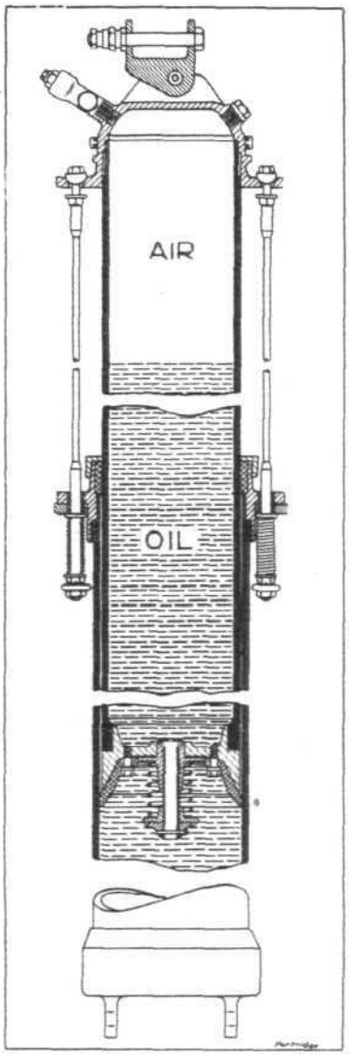
THE BOULTON AND PAUL "PARTRIDGE": General arrangement drawings.

A somewhat unusual feature in the wing arrangement of the "Partridge" is provided by the absence of any top centre-section. The two halves of the top plane meet on the centre line, and the top spars are joined together by simple fish plates. One result of this arrangement is a certain saving in the number of spares required. The bottom wing halves are joined to the fuselage frame by pin joints, details being illustrated in the sketch, Fig. 4, on this page. The wing bracing is in the form of a single bay each side, with the usual lift, anti-lift and incidence bracing of streamline wire.



THE BOULTON AND PAUL "PARTRIDGE": Some constructional details. (1) Main wing spar joint. (2) Inter-plane strut with end attachment. (3) A typical fuselage frame joint. (4) The wing spar attachment joint in front portion of fuselage frame. (4) Outer hinge of elevator. (6) and (7) Sectioned view and section of petrol tank. (8) The arrangement of pilot's adjustable seat. (9) The oil tank. (10) Vertical section of oil tank showing cooler. (11) The tail skid.

In the construction of the wings standard stock sections are employed throughout, the main spars being of high tensile steel and the ribs of Duralumin. The sketches on p. 1033 show most of the typical details of the wing construction, such as main spars, ribs, leading and trailing edges, etc. The spars are of the standard Boulton and Paul type, with corrugated flanges and webs, with tubular and plate stiffeners. In nearly all types of built-up box spars of metal, the problem is not so much to produce a strong and cheap spar but to turn out one to which ribs and inter-plane strut fittings can be easily and neatly attached. The way in which the ribs are attached to the spars in the "Partridge" is illustrated on p. 1033. Channel section pressings have projections which enter the rib flanges and are riveted to them, the pressings being slotted to locate the rib on the spar, and held in place by large tubular rivets which pass through the standard tubular stiffeners in the spar webs. The methods of attaching leading and trailing edges will be clear from the sketches, but it might be pointed out that in the case of the trailing edge use is made of small die castings riveted to the rib flanges. The ribs, it should be mentioned, are all of Duralumin, and are generally of the type shown, although certain special ribs are of slightly different construction.



The Boulton and Paul "Partridge": Sectional view of oleo-pneumatic undercarriage leg.

The inter-plane struts are made of Boulton and Paul standardised sections in Duralumin. They consist of a main member made in two parts: a front portion of U-section and closed at the back by a transverse wall, which forms the load-carrying part of the strut and also the nose of the streamline section. To this main strut structure is attached a tail fairing of wood, which slides into the flanges provided at the rear of the main front member. The attachment to main spar joints is by a "T"-shaped fitting and one bolt, as shown in Fig. 2, on p. 1031.

The type of joint used for connecting inter-plane struts, drag struts, wire bracing, etc., to main spars is shown in Fig. 1, on p. 1031. The joint consists of high-tensile steel channel plates riveted to the spar webs on each side, and of detachable high-tension steel side plates. With the exception of the side plates, all parts of the spar joints are made with standardised tools.

The tail surfaces are, generally speaking, of similar construction to the wings.

Undercarriage.—This is of standard type for single-seater fighters, *i.e.*, a plain two-wheeled structure with cross axle and oleo-pneumatic front legs for absorbing the shock, the rear legs of the vee being radius rods. A diagrammatic sectional view of an undercarriage leg illustrates the general principle.

The tail skid is of the tracking type, and has a shock absorbing leg making use of rubber blocks in compression. The skid is steerable by the rudder bar through cables and a spring box to absorb ground shocks.

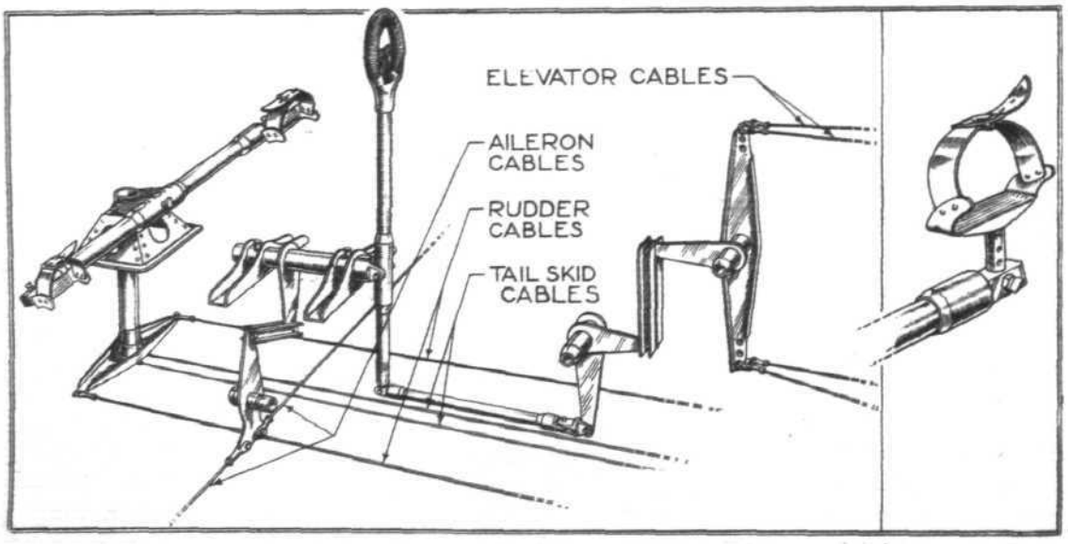
Engine Mounting and Cowling.—The engine mounting consists of a high-tensile steel ring plate connected to the longerons of the front frame of the fuselage by four solid drawn high tensile steel tubes, braced in the side bays by similar tubes and in the top plan bay by tie rods. The engine cowling, which blends into the streamline body shape, consists of a forward heavy ring or dummy exhaust ring, and a ring behind the cylinders connected by stiffened plates between each pair of cylinders. The cowling has been designed with a view to its easy and rapid removal, and is very robust. The dummy exhaust ring can be replaced by a real exhaust ring without modification to the remainder of the cowling.

Petrol and Oil Systems.—The petrol tank is situated in the front frame of the fuselage, between engine and pilot. It consists of an outer shell with its top surface forming a removable lid, an internal tubular structure partly braced by tie rods and partly by the inner service tank which is built into the main tank. The inner tank serves the dual purpose of service tank and baffle, and is filled automatically through a re-entrant filler from the main tank. Inner and outer tanks are connected to a three-way cock so constructed that only one tank can feed the engine at one time. The internal structure, in addition to stiffening the tank, forms the greater part of the tank bearer and also braces the fuselage frame bay which contains it without transmitting the stresses to the tank shell. The connection between the tank shell and the internal structure ends consists of plugs screwed into the tube ends from outside, and using special cork washers.

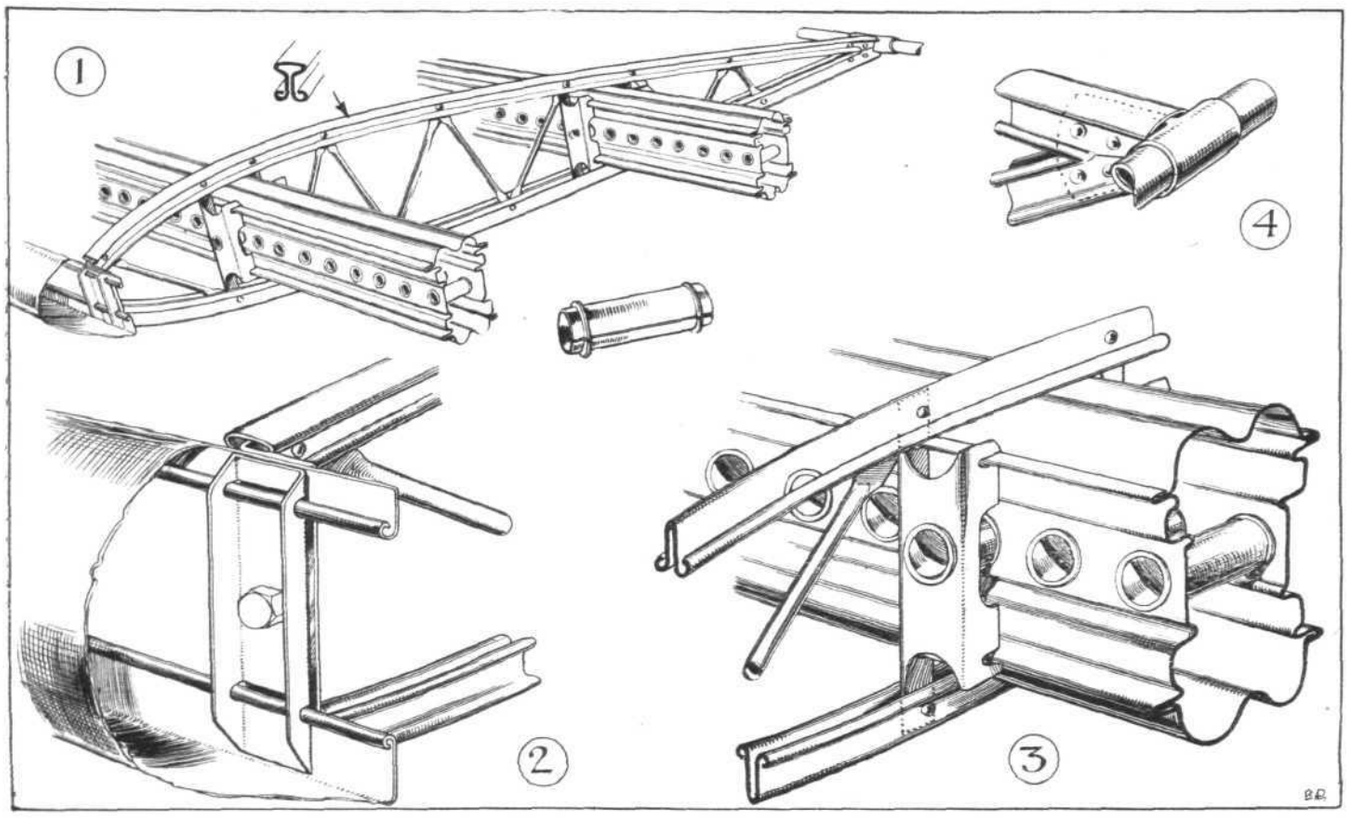
The oil tank is situated on the starboard side of the fuselage, and incorporates an oil cooler in its outer surface, which conforms to the shape of the body. Oil is fed into the cooler through a valve so arranged that should the oil pressure rise above a certain amount, the oil is by-passed direct into the tank, the cooling being thus automatically controlled.

Cockpit Arrangements

The pilot's seat is of the "pan" type to accommodate the seat type of parachute. It is adjustably mounted



The Boulton and Paul "Partridge": Perspective diagrammatic view of the controls. Inset, the adjustable pedal.



THE BOULTON AND PAUL "PARTRIDGE": Some constructional details of the wings. (1) General view showing main spars and a rib. (2) Attachment of metal leading edge to rib. (3) Attachment of rib to main spar. (4) Attachment of tubular trailing edge to rib.

(see sketch) by means of a lever working in a notched quadrant, so that the pilot can raise and lower the seat while in flight.

The controls are of normal type, and include a tail-trimming gear with an indicator of angles placed on the instrument board. A perspective diagrammatic sketch illustrates the general scheme of the controls, and should be self-explanatory.

The equipment includes two Vickers guns with ammunition, wireless, parachute, oxygen apparatus, etc.

Main Characteristics and Performance

The chief dimensions of the Boulton and Paul "Partridge" are given on the general arrangement drawings. With Bristol "Jupiter Series VII" the machine has a total all-up weight of 3,097 lbs. (1,408 kg.) made up as follows:—

	Lbs.	Kg.
Power unit (including fuel and oil)	1,500	(682)
Wings	424	(193)
Fuselage	342	(155)
Tail unit	79	(36)
Undercarriage and skid	156·5	(71)
Controls	45·5	(20·7)
Military load	550	(250)

For a total loaded weight of 3,160 lbs. (1,436 kg.) the "Partridge" has a top speed at 20,000 ft. (6,100 m.) of 164 m.p.h. (264 km./h.) and a service ceiling of 28,950 ft. (8,825 m.). The landing speed is 61 m.p.h. (98 km./h.).

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New Nairobi Aerodrome

THE air route to South Africa from Europe is now comparatively familiar to many light aeroplane tourists, and therefore the establishment of a new aerodrome on that route is almost as important an item of news to tourists as is the location of a new emergency field in England. Mr. Graham Dawson, of Nairobi, Kenya Colony, forwards an extract from the October issue of "Aeroken," an interesting official organ of the Aero Club of East Africa. There are several reasons why Nairobi should have a new aerodrome. The present site on the Ngong Road is considered useless for large commercial aircraft, although admirable for light aeroplanes, and enlargement is prohibitive owing to the cost. Also, its distance from Nairobi is a disadvantage, being six miles from Nairobi House. Further, the site does not belong to the Crown. In fact, it is part of a Native Reserve.

The new site is situated about two miles from Nairobi on the M'bagathi Plains. During Capt. Tymms' visit to the district, he spent considerable time finding a suitable place, and recommended that now chosen, upon which work has already commenced. At first the whole area will not be used, and it has been suggested that a circle of 600 yards in diameter should be levelled, then extended later to the wider area of 1,100 yards diameter. Supplementing this extract, re-published in the "East African Standard," Mr. Graham Dawson states that there are no trees or wires in the vicinity for some distance, and for several miles to the south there is open plain, where forced landings are possible without damage to machine or occupants. The British East African Airways, Ltd., is being formed with the Right Hon. Lord Delamere as chairman, and Mr. John Carberry, the pioneer airman and private owner-pilot, has agreed to act as director. The latter left Amsterdam in his Fokker monoplane, "Miss Africa," on November 27, and reached Paris. The next day he took off for Perpignan on his way to Kenya Colony.

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Air Defence of the Empire

SIR SAMUEL HOARE gave an address on "Air Defence of the Empire" on November 29, at the annual luncheon of the Conservative Women's Reform Association at the Hyde Park Hotel. He mentioned that when he went to the Air Ministry five years ago they were spending £20,000,000 a year on the defence and security of their mandated countries. The Air Force took over the garrisoning of those countries, and the expenditure, as a result, had been reduced to less than £2,000,000 a year.

Vickers and Supermarine

IT is announced that Vickers (Aviation), Ltd., one of the subsidiary companies of Vickers, Ltd., has acquired all the share capital of the Supermarine Aviation Works, Ltd., of Southampton. Both names are, of course, well known throughout the world in connection with the aircraft designed and constructed by each respectively—the large bombing and troop-carrying machines of Vickers are as familiar everywhere as are the various types of flying boats and the Schneider Trophy winner of Supermarines. The new amalgamation, however, is mainly a financial one, and the Supermarine Aviation Works, Ltd., will continue as a separate company with the same personnel as before.

COMMERCIAL AVIATION PROGRESS IN CANADA

FROM the experimental stage but a short while ago the aerial mail has become a real and vital thing in Canadian life. A signal event during October was the inauguration of mail delivery by air between Albany, New York and Montreal and Toronto, establishing a regular service between the United States and the Dominion's metropolis and Queen city. This was the first international air mail service on the continent and was inaugurated with fitting ceremony and the attendance of eminent officials of the United States and Canadian Governments. A few days later, through the inauguration of air mail services between the United States and Mexico, Canada was given direct mail connection by air with the latter country. The two hundred miles' course from Albany to New York normally occupies about two hours' flying, though it has been accomplished as briefly as in ninety minutes.

According to a report just issued by the operating company, this service earned a net profit of $3,000 during its first month. During October, 35 passengers were carried together with 10,885 lbs. of mail, representing some 34,200 pieces. A total of 21,877 miles were flown and the gross receipts amounted to approximately $17,000.

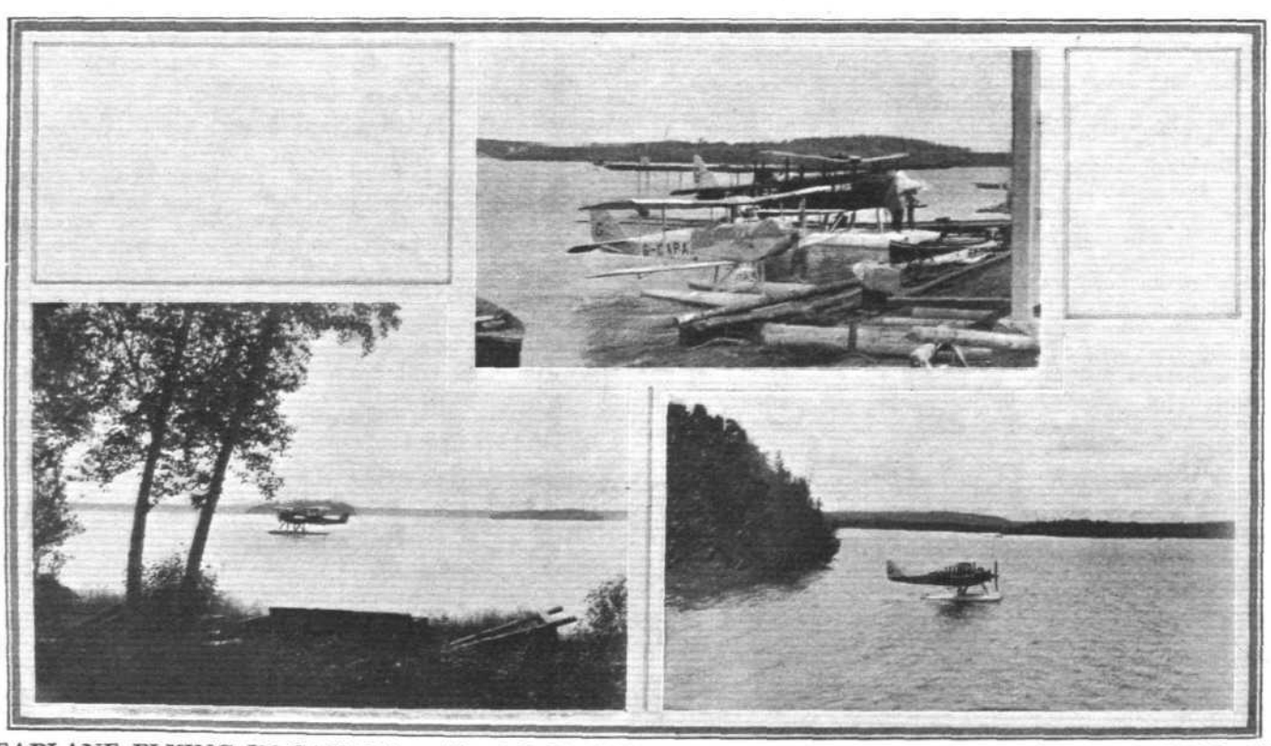
A programme of consistent expansion has been laid out for the air mail service in the Dominion. It has been announced by the Postmaster-General that a winter air service to Montreal of certain trans-Atlantic mail landed at Halifax and Saint John will be established shortly, similar to the summer service of air mail which has heen conducted between Rimouski on the St. Lawrence Gulf and Montreal, and that if successful, the new service will be placed on a permanent basis. Air mail delivery will be continued during the winter from Quebec to points along the north shore of the St. Lawrence, including Murray Bay and Seven Islands, and that from Moncton to the Magdalen Islands.

The post office department has also announced that Western Canadian cities will have connecting air mail services shortly and that plans are now under way whereby mail from across the Atlantic and destined for western points will be rushed by air over routes other than the present one linking the St. Lawrence ports with Ottawa and Toronto. Anticipating and in preparation for this, the Western Canada Airways has inaugurated a regular tri-weekly air mail service between Winnipeg, Regina, Calgary, Edmonton, and Vancouver, with extensions to other points contemplated.

There is every likelihood that passenger-carrying services will develop with those carrying mail solely. It is announced that in the coming spring a regular daily passenger service between Toronto and Windsor and Montreal will be inaugurated, and that another service will have a daily schedule between Toronto and Buffalo. Yet another will, in the summer months, fly passengers between Toronto and the Muskoka Lakes. The air mail services recently established to connect Western Canadian cities are also carrying freight and passengers. Altogether the time would seem not far distant when not only will mail be carried from Atlantic to Pacific by air, but passengers will be able to make the entire journey by 'plane.

The future which has been predicted for Montreal as a great air centre, the focus of many radiating services, was brought a step nearer realisation in the announcement that work upon the creation of a modern air harbour for the metropolis, with the provision of customs and immigration buildings and all necessary equipment, will be started immediately in the vicinity of Canadian Vickers, Ltd., plans having been prepared and approved by the Montreal Harbour Commissioners and the Department of National Defence. Two breakwaters, 300 ft. in length, will be built out into the river to provide comparatively calm waters for mooring machines, and two floating platforms will be installed to enable aviators, passengers and others to come alongside the platforms in fair weather, though boats will be available to take the machines out to mooring buoys that will be provided. The new air harbour will be equipped with flood lights and other beacons necessary for safe aerial navigation at night. It has not yet been decided whether the new air harbour will be administered as a national concern by the Department of National Defence or by the Montreal Harbour Commissioners. The Government has entered upon the development of a first-class aerodrome at St. Hubert, just outside Montreal, and there seems every likelihood of it taking over the air harbour as well.

Meanwhile, steady progress is being made in the expansion and improvement of the St. Hubert aerodrome which promises to become one of the finest in America and adequate to Montreal's importance as a national and international aerial centre. In particular, has there been sustained activity in preparation for the airship service to be inaugurated between Great Britain and Canada. The great mooring mast designed as an anchorage for the giant airships will be ready before Christmas though it is anticipated it will be at least nine months before the arrival of the first lighter-than-air machines from overseas, which will forge the first link in a chain of Imperial airways. Steps have been taken to give the fullest co-operation as soon as the first airship is prepared to start its voyage. Charts have been prepared dividing the Atlantic into meteorological zones, and during the flight Canada land stations or ocean vessels will be in constant wireless communication with the craft to give warnings of storm conditions. Canadian air officials were at



SEAPLANE FLYING IN CANADA : (Top) D.H. "Moth" seaplane, D.H. 61 seaplane, and an old H.S. 2Ls flying-boat at the Sioux look-out base of the Ontario Government Air Service. (Below) Ontario Government's D.H.61 seaplane on Lakes Renir and Oba.

Lakehurst, New Jersey, on the arrival of the "Graf Zeppelin" to make a close study of the mooring of the airship.

The progress Canada is making in aerial affairs along lines followed by other countries after having achieved a signal and unique development in the peculiar direction she adopted, is highly gratifying. The machine of the air now enters effectively into practically every phase of Canadian life and is steadily widening the scope of its influence. The progress of flying clubs throughout the Dominion has been highly encouraging, and these have had a marked effect in extending the utilisation of the 'plane in Canadian life and in developing "airmindedness" in the Canadian people. The future promised for aviation in the Dominion is inducing an ever-growing manufacturing industry, which forecasts a definite independence for Canada in this field. The latest announcement along this line is that Fairchild 'planes, which have previously been manufactured under licence in Canada, will now be built in their own Canadian factory.

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AIR SURVEY AND EMPIRE DEVELOPMENT

COL. H. L. CROSTHWAIT, C.I.E., R.E. (retired), gave an interesting lecture on "Air Survey and Empire Development" at the Royal Society of Arts on November 27. Sir Thomas Holland was chairman. Col. Crosthwait said that the total area of the British Empire was nearly 14,000,000 square miles, and if they considered a country as *surveyed* if it was covered by ½-in.-to-the-mile or larger scale maps, executed on scientific lines by an established survey department, they found that only about 20 per cent. of the whole area came within that category. Those figures showed how little had been done. As an instance of the omission to map the colonies, we had been in occupation of Jamaica since 1655, just 273 years, yet there was not a single map of the island of any value.

One great disadvantage of the production of maps by normal survey was its extreme slowness. By the use of air photographs it was possible to speed up the mapping. They could be taken at the rate of 80 to 100 square miles per day, which meant having down on paper all the topographical details of the ground in extremely short time.

All did not end there. Points had to be fixed on the ground to form a framework to control photographs, both as regards planimetry and height. That framework in extent depended on the nature of the country under survey, but certainly less ground work was required than in the case of normal survey. Then, the photographs required interpretation, object names had to be collected, and maps drawn and printed embodying detail derived from the photographs after reduction to the proper scale. All that progressed rapidly after the photographs were taken.

From the fact that the photographs were taken from the air, it was not so material whether the country could be classed as easy or difficult for normal methods of survey. It was just as easy to photograph forest country from above as open spaces. Air methods involved minimum work on the ground, and in unhealthy areas the ground staff was reduced and remained for the shortest possible time in the locality.

Col. Crosthwait then explained how air survey was carried out.

The given area was divided into suitable sections, which were covered by vertical photographs from an aeroplane flying along parallel straight lines, using the Williamson Manufacturing Co.'s "Eagle" camera, which was capable of making 100 exposures on a single roll. The photographs were taken with a 60 per cent. overlap in a forward direction and about 30 per cent. overlap in a lateral direction. After development and printing they were roughly joined and given to field surveyors, who fixed suitable points for purposes of control, which could be easily recognised both on the photographs and on the ground. They also classified objects such as roads and collected the object names required for the final map.

That fixing of points could be done by triangulation if the country was suitable, but often the areas were wooded and intersected by waterways, so that it was now usual to fix points by astronomical observations; that was, determine their latitude and longitude by wireless time-signals, made possible by the broadcasting of the Greenwich time-signals. A comparatively new instrument of French invention had come into use in this connection called the Prismatic Astrolabe, made by Messrs. Casella. There was also a survey wireless time receiver made by Messrs. Marconi.

Another method had also been employed. Instead of taking vertical photographs, oblique photographs were taken in such a manner that the horizon was visible in the picture. But it was not suitable to every class of country. The ground should be flat and the horizon visible when the photographs were taken. The method had been largely used in Canada. Col. Crosthwait also explained other uses to which air photography could be put in connection with economic development. It was extremely applicable to the location of railways in undeveloped or partially-developed countries, where either no maps existed or were of a small scale only; the object being to assist the railway engineer to decide the best economical line to construct. The faulty alignment of a railway might be the cause of considerable and continuous loss. Among engineering uses to which air photography was applicable was the investigation of water-power development, water storage for irrigation purposes, and allied engineering projects. It had been found that the feasibility of a water-power scheme, involving storage of large quantities of water, necessitating the submergence of considerable areas of land, could be ascertained from the study of air photographs in the stereoscope, with a very small amount of ground work.

With regard to the relationship with economic development of new countries, continued the lecturer, Mr. R. Bourne, of the Imperial Forestry Institute at Oxford, had recently brought out a most interesting and important pamphlet dealing with the subject. In it he described the results of his investigations in Northern Rhodesia, using air photographs originally taken by the Aircraft Operating Co.'s expedition in that country under Maj. C. K. Cochran-Patrick, D.S.O., M.C., for the Rhodesian Congo Border Concession, Ltd. who kindly allowed the photographs to be used.

In conclusion, Col. Crosthwait remarked that for a survey of a country to be really effective, and promote the interests of development to the fullest extent, it was necessary that all Government departments should co-operate so that all information required by each one of them should result from the survey.

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"With Cobham Round Africa"

WE referred the other week to the private view of a very excellent film, under the above title, concerning Sir Alan Cobham's survey flight round Africa in the Short-Rolls-Royce "Singapore" flying-boat. Although the general release date for this film is not until July next, the public now have the opportunity of seeing for themselves this remarkable record of an equally remarkable flight. It is now having a special run at the Pavilion, Marble Arch, and we thoroughly recommend all FLIGHT readers, who can possibly do so, to go and see it, for, as we remarked before, it is not only one of the best aviation films we have seen, but it also scores as regards a story of adventure, and as a study of nature, geography and pictorial effect.

Air Mails

THE Postmaster-General announces that, owing to the suspension of certain connecting air services abroad, the Letter Air Mail Services to Denmark, Sweden and Norway, and the Air Parcel Services to Denmark and Sweden, have been suspended until further notice. Also, regarding Colombian Air Mails, that as from December 1, the minimum charge of 10*s.* per parcel on parcels intended for transmission by the Scadta air service in Colombia (South America) will be abolished, and the charge will be at a flat rate of 4*s.* 6*d.* per lb. Air parcels can now be accepted for all places in Colombia.

Air Mail Stamp Designs

A SERIES of designs for air mail stamps is on view at the headquarters of the Aero Club of France, in Paris. One or more designs are to be chosen for permanent use.

The Royal Air Force Memorial Fund

THE usual meeting of the Grants Sub-Committee of the Fund was held at Iddesleigh House, on November 29. Lieut.-Commander H. E. Perrin was in the Chair, and the other members of the Committee present were:—Mrs. L. M. K. Pratt-Barlow, O.B.E.; Mr. W. S. Field; Sqdn.-Ldr. Douglas Iron, O.B.E. The Committee considered in all 19 cases, and made grants to the amount of £402 14*s.* 6*d.*

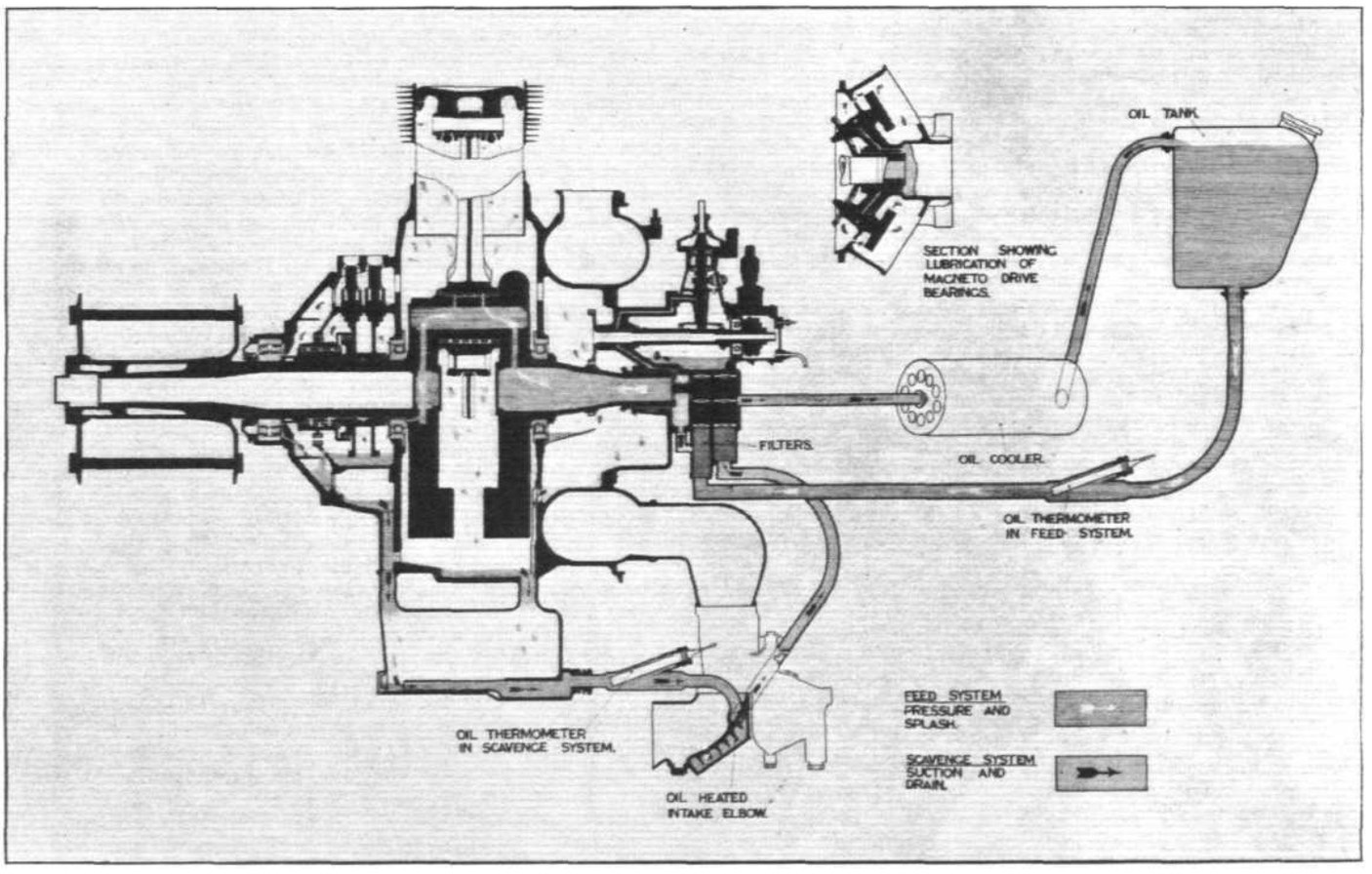
THE BRISTOL "JUPITER" FAMILY—(IV)

(Concluded from p. 1005.)

Lubrication System

REFERENCE was made previously to the drive for the oil pumps, which is in the form of a notched driving plate which engages with two dogs on the tail end of the crankshaft, the plate being liberally perforated with holes so as to provide a passage for the oil from the pump into the hollow crankshaft. In the present article it is proposed to deal with the pumps themselves, and with the circulation of oil inside the engine. Before going into details, however, it may be well to state that the general lubrication system of the "Jupiter" is of the "dry sump" type, in which fresh oil is supplied under pressure from one pump, and, after passing through the engine is withdrawn by another known as the scavenger pump, and returned, *via* a cooler, to the tank. Certain parts are supplied with oil under direct pressure, while others are lubricated by splash. Oil is delivered under pressure to the cam gear, the big end of the master connecting rod, the magneto and oil pump drives, and thence into the hollow crankpin. Two ducts are drilled radially through the crankpin wall, and their outer ends emerge on a flat formed on the outer face of the pin, the oil thus being admitted to the inner surface of the floating bush, which is interposed between the crankpin and the master rod big end. A number of holes in the bush itself pass the oil to the outer surface of the floating bush, and thus to the big end of the master rod. From the ends of the floating bush the oil emerges, and is splashed to the inner surface of the crank-case, cylinders, pistons and small ends, etc.

The main pressure supply leaves the inside of the crankpin through a duct in the front web, and this communicates with a broad shallow oilway formed on the front portion of the shaft. The components situated on the shaft (*i.e.*, main bearing, crankshaft sleeve and eccentric of cam mechanism) form a cover over this oilway and form a reservoir from which the cam sleeve is lubricated via a groove and holes in



THE BRISTOL "JUPITER VI": Diagram of lubrication system.

c.c.-gun gear drive, and gas-starter distributor drive. Splash lubrication by the oil which has drained from the parts mentioned above is supplied to the pistons, small ends of the connecting rods, wrist pins of articulated rods, main crankshaft roller bearings and spherical roller bearing, and tappets and cam faces. The valves probably receive a certain amount of lubrication from oil that has passed the pistons.

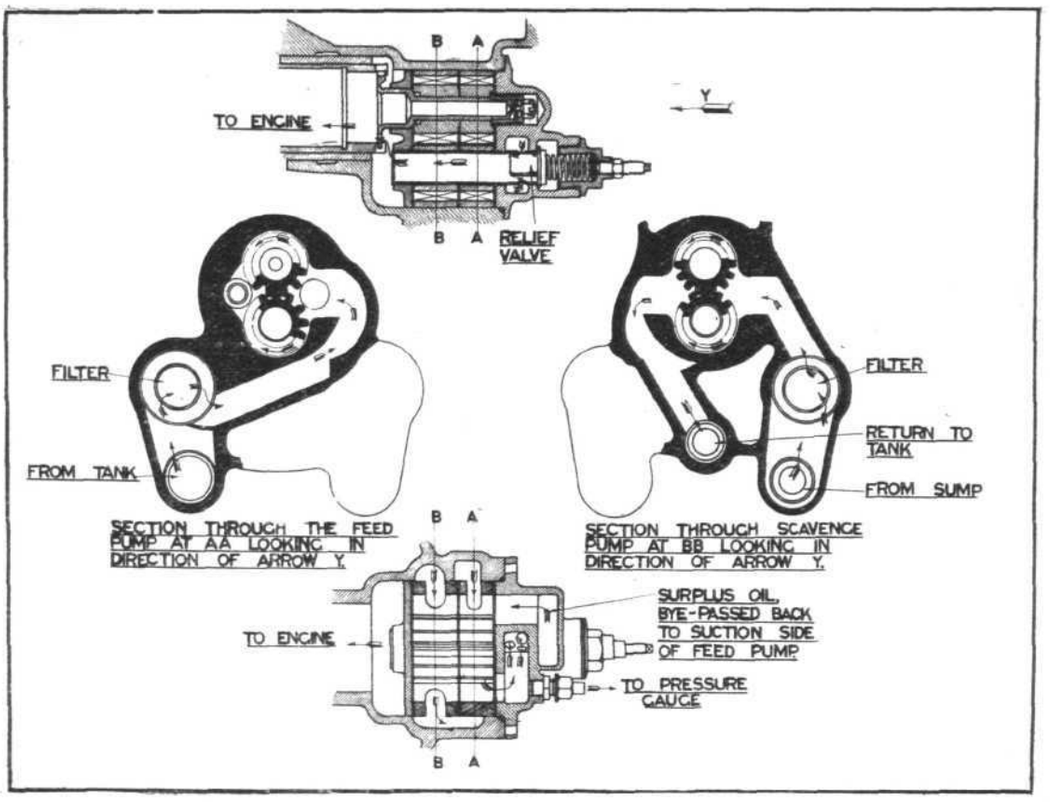
The scavenger pump (which has a capacity of approximately one-third greater than that of the pressure pump) collects oil from the sump unit at the bottom of the crankcase, and returns it by way of an oil cooler, to the main oil tank. From the oil tank the oil runs to the pressure pump under the force of gravity.

The Internal Oil Circulation

The oil delivered by the oil pressure pump into the hollow bore of the rear end of the crankshaft passes through the shaft bore to a duct drilled in the rear web of the crank throw, crankshaft sleeve. From the recess between the two halves of the cam sleeve bushes the oil is distributed over the surface of the bushes by spiral grooves. The intermediate bearing, *i.e.*, the roller bearing immediately in front of the front web, is splash lubricated by oil thrown off from there. The eccentric of the cam gear has two recesses formed in its bore, from which holes communicate with the compound pinion. Oil from the pinion and from the cam sleeve lubricates the rest of the cam mechanism and the front main bearing. A spring-loaded brass ring on the crankshaft makes contact with the surface of the thrust bearing housing, and prevents the oil from leaking out through the front.

Of the drives, etc., on the back of the engine, the white-metal bearing of the magneto drive sleeve is supplied with oil bypassed direct from the pump chamber, and led by a duct drilled in each magneto drive spindle to its bearing. A duct in the rear cover leads to the plain bearing of the C.C. drive spindle, and from there upwards to the spindle of the gas

FLIGHT



The Bristol "Jupiter VI": Diagrams of oil pumps.

starter distributor. In the later types of "Jupiter" there is an external oil pipe which supplies the upper part of the gas starter distributor.

As regards the scavenger system, surplus oil drains from the front main crankshaft bearing through holes in the fixed internal gear plate into the front cover, and from there through a passage communicating with the front "leg" of the external sump under the engine. The oil from the interior of the crankcase drains, through holes in the bottom, into the rear "leg" of the sump. At the lowest point of the rear wall of the crankcase there is a hole through which drains the oil from the various assemblies on the rear cover.

The Oil Pumps

The two oil pumps, pressure and scavenger, are of the gear type, and form one unit, housed in a chamber in the rear cover of the engine. This chamber communicates with the rear end of the hollow crankshaft. Formed integrally with the rear cover are two horizontal cylindrical filter chambers placed one on each side of the pump unit, that on the right housing the scavenger filter, and that on the left the pressure filter. The outer ends of the filter chambers are closed by hollow screwed plugs, and to these are attached the filters themselves.

The pump unit is built up in sections clamped together between end plates by four long bolts, and the rear end plate carries a pressure relief valve. The aluminium gears which form the pumps comprise driving pinions and idler pinions, and are mounted on hollow parallel spindles. The upper is the drive spindle, and has formed on it two grooves engaging with dogs formed in the driving gears of both pumps. The difference in capacity between pressure pump and scavenge pump is obtained by making the pinion of the latter longer than the former. The idler spindle (the lower) is of larger diameter than the driver spindle, and serves to convey the oil from the pressure pump to the crankshaft. The sectional views accompanying this article should explain the arrangement.

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MR. SAMUEL WHITE, J.P.

WE regret to announce the death of Mr. Samuel White, J.P., Chairman of the Bristol Aeroplane Company Ltd., Bristol. He died on November 29 at his residence at Clifton Down, Bristol, at the age of 67 years.

He became a member of Bristol Stock Exchange in 1889 and his success was closely bound up with that of his elder brother, the late Sir George White, Bart. In many of the important financial transactions in which Sir George was conspicuous, Mr. White bore his share of the responsibility. The case of the Bristol Tramways and Carriage Co. affords an illustration. When Sir George became managing director in 1894, Mr. Samuel White was appointed secretary, and six years later, upon Sir George being made chairman of the company, he was followed in the office of managing director by his brother.

When Sir George died suddenly in 1916 Mr. Samuel White succeeded him as chairman, as he did in the case of the Bristol Aeroplane Co., Ltd., the Imperial Tramways, Western Wagon and Property Co., and the Main Colliery Co. Bristol owes its first-class tramway, motor-bus, and charabanc services to the energy, ability and foresight of those two gentlemen. They were pioneers in the adaptation of electricity to road traction, and in the use of the motor engine. Their operations were not confined to Bristol and they rendered equally valuable service to London and other places as well.

When aviation was in its infancy, Sir George White realised the need of British capital being freely employed in experimental work if this country was to hold its own on a matter possessing such far-reaching possibilities. Mr. Samuel White, as in earlier undertakings, gave his brother loyal support and had his share in the formation of the British and Colonial Aeroplane Co., with headquarters at Filton. Bristol machines speedily gained a world-wide reputation, and thanks to the energy displayed, England took a foremost place in the development of aviation, while Bristol was given a valuable advertisement at a time in its history when it was most needed. Only a rich man could have embarked upon such an enterprise.

The passing of Mr. Samuel White will be deeply regretted by all who were associated with him in public work, and even more by those who were intimately associated with him in his private efforts to promote the welfare of his fellows. His generosity to the Royal Infirmary at a critical period in its history is well known.

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Owner-Pilot and Goal-Keeper

MISS BROWNE, the private owner pilot of an Avro "Avian," kept goal in a hockey match for the Lancashire Women against Middlesex at Twickenham on December 1. She intended to fly down for the match, but fog in the Midlands prevented her.

AIRISMS FROM THE FOUR WINDS

Great Flying-Boat Cruise

THE four R.A.F. Supermarine "Southampton" flying-boats engaged on an extension of their Far East cruise, left Hong Kong on November 29 for the return flight to Singapore. The first stage was to Tourane. Group-Captain H. M. Cave-Browne-Cave is in command.

Lady Bailey

IT is reported that Lady Bailey, who is flying home from South Africa in her D.H. "Moth" (Cirrus), intends to fly the Sahara, and has asked the Compagnie Generale Trans-Saharienne to assist her by providing fuel depots across the desert. On November 28, Lady Bailey reached Gao (French West Africa), which is on the Niger.

Austrian Air Progress

IN the first three-quarters of this year, Austrian air lines made 6,730 flights and carried 16,420 passengers and 638 tons of goods, mail, and luggage. There was no accident of any consequence.

New Zeppelin to be Constructed

IT is stated that a new and larger Zeppelin airship is to be constructed in Germany for Dr. Eckener with money provided privately. A North Pole expedition will be undertaken in 1930 with the "Graf Zeppelin" which recently flew to America and back from Germany. Bases will be at Leningrad on this side of the Pole, and Nome, Alaska, on the other side. Anchoring masts will be erected at those places by the Russian and American Governments. The object of the expedition, writes a *Daily Telegraph* correspondent in Berlin, will be not so much a study of the Pole itself as the geographical illumination of the Inner Arctic, especially the region between the Pole and Cape Barrow. The first flight of exploration will be made in a loop from Nome to the centre of the Arctic region, and back to the starting point. The airship will then cross the Polar region directly to Leningrad.

Commander Byrd's Expedition Leaves

ON December 2, Commander Byrd's ship, the *City of New York*, left Dunedin, New Zealand, for the Bay of Whales with his expedition as the next stage in his Antarctic air exploration.

Japanese Air Pageant

DURING the recent enthronement ceremonies of the Emperor of Japan, 153 aeroplanes, under the supreme command of Field Marshal Prince Kanin, flew in various formations over Tokio.

An Air Mail in China

THE first air mail route to be opened in China since the experimental service in 1921, was expected to commence on November 30 with the arrival of the monoplane "Canton" at Shanghai from Mukden.

U.S.A. Aircraft Orders

THE War Department of America is calling for 2,400 aircraft. In a statement, it declares that some aero engines are unreliable and uneconomical, and should be replaced by others.

African Development

NEGOTIATIONS between the South African Government and Mr. John Keyser are proceeding for the inauguration of an air line for all kinds of traffic between the Rand and Durban. Later it is hoped to link up Rhodesia and South-West Africa. The corporation behind Mr. Keyser is prepared to provide a capital of £100,000 when a contract with the Government is signed. Experts advised the use of Junker machines, but as the line may link with the projected Imperial Airways service between Cairo and Rhodesia, British aircraft have been decided upon. The Government subsidy is anticipated to be £15,000 per year.

Rohrbach "Rostra" Under Test

THE final test flights of the Rohrbach "Rostra" flying-boat at Travemunde, Germany, are being completed. It is proposed to fly the machine across the Atlantic *via* the Azores shortly, to test the possibility of air services on that route. The pilot's only passenger will be Mrs. Mildred Johnson, who will collect the necessary freight. Two Bristol "Jupiter" 450 h.p. engines provide the power, and the range of the machine is 2,250 miles.

Brazilian Seaplane Disaster

A SEAPLANE said to be carrying seventeen people crashed at Rio de Janeiro, which it had left to greet the steamer arriving with Senhor Santos-Dumont, the pioneer aviator, who was being received with honours by Brazil on his return to his own country. All were killed. The festivities were cancelled by order of the Government and a day of mourning proclaimed. Many leading citizens were among the passengers. The machine, which belonged to the Kondor Syndikat, was said to be flying at 300 ft., and narrowly avoided collision with another machine; then, apparently, a wing collapsed, and a spin resulted. Only the mechanic was recovered, and he died shortly after. Santos-Dumont was born at San Paulo, and at the age of 28 years he won the £10,000 prize offered by M. Deutsch for navigating an airship round the Eiffel Tower. Later, he turned his interests to heavier-than-air machines.

Air Line to India

IN a written reply to a question in the House of Commons, Sir Samuel Hoare announced that an agreement had been reached between the Persian Government and Imperial Airways about the establishment of bases in Persia for the air service between Great Britain and India.

Troubles in Afghanistan

HOSTILITY to the "Westernising" reforms introduced by King Amanullah to his country of Afghanistan since his European tour has had one sequel in the burning of hangars, and the destruction of aircraft is believed to have occurred.

Altitude Record Fails

A NEW York report states that Lady Heath attempted a new altitude record at Curtiss Field on December 3, but failed to get higher than 15,000 ft. in the course of two hours' flying. Lady Heath recently went to America to undertake a flying lecture tour.

Two American Aircraft Firms Combine

TWO well-known American aircraft-constructing firms have just united. These are the Keystone Aircraft Corporation, of Bristol, Pennsylvania, and the Loening Aeronautical Engineering Corporation, of New York. The former (originally known as Huff-Daland Airplanes) was established in 1920, and has produced several successful military machines including large bombers, while the latter company is, of course, famous for the original Loening amphibians. Both the Loening plant at New York and the Keystone plant at Bristol will continue to operate as at present, and, in addition to the existing types of aircraft, a complete line of commercial cabin amphibians and tri-motored land-transports will be produced by the new combine.

Air Ministry's Exhibit of R33 Control Car

THE Air Ministry is again taking part in the Schoolboys' Own Exhibition, to be held for the fourth consecutive year during the Christmas holidays. The opening of the new Royal Horticultural Hall at Westminster has enabled a considerable extension of the exhibition. The Air Ministry's display will include the control car of R33 and a fully-equipped fighting scout machine.

Irish Aero Club, Ltd.

A COMPANY has been registered in the Saorstat under the name of the Irish Aero Club, Ltd., with the object of establishing a club or clubs for the furtherance of civil aviation. It is a guaranteed company and has no share capital.

Flapping Wings

A BRIEF Paris report speaks of a new machine embodying the principle of flapping wings. The inventor is a French scientist, M. Arnaud Tindon. His invention is apparently a biplane with a rigid top plane and a flapping lower plane.

Cork Air Port

A CAPITAL involved in the establishment of an air port at Cork, Ireland, would be, it is estimated, about £15,000. It is urged that an air port there would be a good investment, particularly from the tourist point of view and the protection of fisheries. But it is thought that until pioneer work is done directly by the Government there is not much possibility of arousing local enthusiasm. Cork is considered favourable for a site.

FLIGHT

PRIVATE FLYING

A Section of FLIGHT in the Interests of the Private Owner, Owner-Pilot, and Club Member

WHY NOT SEAPLANE CLUBS?

WE know that the sea is not what it used to be since aircraft spanned its distances and drew Europe and even America nearer to England, but what they taught us at school about Great Britain being surrounded with water is not one bit less true, and no change is ever likely to occur except through some new cosmic law.

Yet in spite of this we have a strange apathy towards our island condition, a neglect in some ways which leaves our coastline with only a nominal existence in our consciousness. If this is not so there would surely be an interest in seaplane flying, for which we possess natural advantageous conditions that could not be bettered. Practically the only seaplane flying done in Great Britain today is that by the Royal Air Force.

Since our sea borders ceased to be effective fortified bulwarks against enemy invasion our interest in them has correspondingly waned until we have become no more of a seafaring nation in the sense that the sea plays a large part in our pleasures, than countries without a coastline. We know we cannot all live by the sea, but we might at least have some seaplane flying in our spare moments as well as land-plane flying. Our attitude in general towards the sea today is such that we only regard it as the place for a fortnight's paddling every year, whilst since the leisurely, complacent seaside town ceased to be a fort and belch fire at any unhealthy intruder, it has become one of the Englishman's standing jokes.

We have forgotten we have a sea to an extraordinary extent, although not one of us can live much more than 100 miles from a coastline.

We have no excuse in lack of experience. Surely no country in the world had its coasts patrolled by seaplane and flying-boat for so long as these islands had during the war. Harbours and bays and even unsheltered coastline harboured bases at comparatively short distances from each other. Speaking of the South Coast alone, can there be an inch that was never patrolled by seaplanes or flying-boats during the war? Can there be a square yard of the Channel even that was left unpassed? Writing from memory one can recall bases at the Scilly Isles, Newlyn in Mounts Bay, Cattewater in Plymouth Harbour, Torquay, Portland, Calshot, Dover, and then some are probably missed.

There are good harbours all round the inhabited parts of the coast which provide practically unrestricted landing areas for light seaplanes and therefore obviate that costly and elusive possession, a land site. Further, they are nearly always more convenient to the town, for it is rare to have a flying field or aerodrome nearer than five miles from the town it primarily serves.

Take two examples: Sherburn aerodrome is 14 miles from Leeds and Hadleigh aerodrome is 8 miles from Ipswich.

It is the traditions of this country in seaplane flying that provokes the opinion that there must be hundreds of the old Royal Naval Air Service pilots who are not too old to have lost their fervour for the joy-wheel, and who would be eager to follow the sport through the medium of seaplane clubs. There were scores of them who used to consider that land-flying had no parallel attraction.

The modern light aeroplanes, Avro "Avian," Blackburn "Bluebird," D.H. "Moth" and Westland "Widgeon," are suitable seaplanes for clubs and are in regular use to-day in various parts of the world as such, although not on the same scale as land types. The Singapore Flying Club operates a D.H. "Moth" seaplane, to mention an example. Col. the Master of Sempill flies a Blackburn "Bluebird" seaplane extensively, and flew it 100 miles across the North Sea to visit the Berlin Aero Show this year.

SEAPLANING: Col. The Master of Sempill racing a Blackburn "Bluebird" light seaplane over the Welsh Harp, Hendon, in competition with an outboard motor-boat. He has toured Great Britain and flown the North Sea in this seaplane.

There is, however, we are glad to say, a promising sign of this apathy being slightly eased. The Suffolk and Eastern Counties Aeroplane Club, which may lack members but does not lack enterprise (witness its weekly air service between Ipswich and Cambridge), has long considered recognising the sea. This is not surprising for another reason, apart from its enlightened outlook. Its honorary secretary, Maj. P. L. Holmes, D.S.C., was a 1914 seaplane pilot. He has succeeded in interesting members of his club in seaplanes to the extent that if ways and means can be found, they propose to start a light seaplane branch in the spring at an

East Coast yachting centre within easy reach of London. As the first club of its kind in the country, it would be national rather than local in its appeal. Assistance will be desired from outside sources to provide the first light seaplane, and this could partly be contributed by those who are interested in flying but did not necessarily wish to fly. They could become associate-members for a fee of £1 1*s*., like those attached to the land plane clubs.

This proposed seaplane branch would only be open to "A" licence pilots. Those who wanted to join as *ab initio* members would have to qualify on land machines either at Hadleigh Aerodrome or at the club's newly-established branch at Conington aerodrome, Cambridge.

The entrance fee of £3 3*s*. and annual subscription fee of £3 3*s*. would cover flying at both places, and at the seaplane branch after qualifying. If there are any enthusiasts of this scheme, they should let Major Holmes be aware of themselves and thus speed its formation.

In conclusion, to our way of thinking, there is more fun to be got out of seaplane flying than land plane flying—that is, in the light of a sport. What are the opinions of our readers on that belief?

THE INCREASE IN PRIVATE FLYING

PRIVATE owners have increased this year at the approximate rate of one per week so far, and our attached list of fourteen new owners brings the total to approximately 128. At the end of last year the total stood at roughly eighty, so that forty-eight have registered this year.

This is no indication, of course, of the production of light aeroplane manufacturers. Some of their outputs rise every week. D.H. "Moths" now average eleven per week, and, incidentally, the D.H. "Gipsy" engines are produced at the rate of fifteen to sixteen per week. They are sold separately, by the way, as well as with the D.H. "Moths."

Our new list signifies the exchange of machines amongst owners as well as new purchases. Amongst the fourteen, Gipsy engines are fitted in the machines of Captain M. Campbell, Mr. G. H. Ambler, Mr. J. W. P. Chalmers and Mr. J. D. Irving. The first-named had the misfortune to be forced to land in the sea off the coast of North Africa recently whilst returning from his air survey of the Sahara for a suitable site for motor racing.

The Duchess of Bedford, who recently flew from her Scottish residence to her Bedfordshire seat at Woburn Abbey, now has a Gipsy-Moth and her former machine is one of the two owned by Mr. T. A. Gladstone, the other being the Blackburn "Bluebird III."

Mr. A. S. Butler, Chairman of the de Havilland Aircraft Co., Ltd., has delayed taking delivery of his new Gipsy-Moth which will be of the Coupé type, until next March, and meanwhile he still flies his ordinary Gipsy-Moth.

Capt. W. R. Bailey returns to ownership with a Gipsy-Moth (Coupé) after a short lapse, and Mr. R. N. Thompson favours the Gipsy-Moth after a long experience with a D.H.53.

New Owners.

Owners.	Machines.	Identification Letters.	Date of Registration.
G. H. Ambler..	D.H. "Moth X"	G-AABI	9.11.28
L. J. Anderson	Avro 504 K	G-AACG	19.10.28
T. S. Baldwin	Avro "Avis"	G-EBKP	11.10.28
Capt. M. Campbell	D.H. "Moth X"	G-AAAJ	19.10.28
J. W. P. Chalmers	D.H. "Moth X"	G-AACO	2.11.28
T. A. Gladstone	Blackburn "Bluebird III"	G-EBWE	24.10.28
T. A. Gladstone	D.H. "Moth X"	G-EBRI	11.10.28
J. D. Irving ..	D.H. "Moth X"	G-AADA	28.11.28
R. H. Jackson	Avro 504K	G-EBYE	2.11.28
R. W. H. Knight	D.H.53 ..	G-EBRK	15.10.28
H. R. Law ..	D.H. "Moth X"	G-EBYJ	15.10.28
D. J. Hamilton-Lister	Avro "Avian III"	G-EBVA	26.10.28
W. L. Runciman	D.H. "Moth X"	G-EBWT	27.11.28
E. K. Rayson	Avro "Avian III"	G-EBWR	26.10.28
P. A. Wills ..	D.H. "Moth" ..	G-EBPS	23.11.28

The following private owners have appeared in previous lists and have new machines, as scheduled :—

A. S. Butler ..	D.H. "Moth X"	G-AACL	7.11.28
Duchess of Bedford ..	D.H. "Moth X"	G-AAAO	11.10.28
Capt. W. R. Bailey ..	D.H. "Moth X"	G-AADC	29.11.28
R. N. Thompson ..	D.H. "Moth X"	G-AACZ	29.11.28

Recent general registrations of aircraft include the following :—

Airwork, Ltd. ..	D.H. "Moth X"	G-AACY	21.11.28
Dominion Aircraft, Ltd.	Avro 504 K ..	G-AACW	19.11.28
Handley Page, Ltd.	D.H. "Moth X"	G-EBXG	23.11.28
Phillips and Powis, Ltd.	Avro 504 K ..	G-EBWO	14.11.28
Phillips and Powis, Ltd.	D.H. "Moth"	G-EBOT	6.10.28

LIGHT 'PLANE CLUBS

London Aeroplane Club, Stag Lane, Edgware. Sec., H. E. Perrin, 3, Clifford Street, London, W.1.
Bristol and Wessex Aeroplane Club, Filton, Gloucester. Secretary, Major G. S. Cooper, Filton Aerodrome, Patchway.
Cinque Ports Flying Club, Lympne, Hythe. Hon. Secretary, R. Dallas Brett, 114, High Street, Hythe, Kent.
Hampshire Aero Club, Hamble, Southampton. Secretary, H. J. Harrington, Hamble, Southampton.
Lancashire Aero Club, Wodford, Lancs. Secretary, F. W. Atherton, Woodford Aerodrome, Cheshire.
Liverpool and District Aero Club, Hooton, Cheshire. Hon. Secretary, Capt. Ellis, Hooton Aerodrome.
Midland Aero Club, Castle Bromwich, Birmingham. Secretary, Major Gilbert Dennison, 22, Villa Road, Handsworth, Birmingham.
Newcastle-on-Tyne Aero Club, Cramlington, Northumberland. Secretary, J. T. Dodds, Cramlington Aerodrome, Northumberland.
Norfolk and Norwich Aero Club, Mousehold, Norwich. Secretary, G. McEwen, The Aerodrome, Mousehold, Norwich.
Nottingham Aero Club, Hucknall, Nottingham. Hon. Secretary, Cecil R. Sands, A.C.A., Imperial Buildings, Victoria St., Nottingham.
The Scottish Flying Club, 101, St. Vincent Street, Glasgow. Secretary, Harry W. Smith.
Southern Aero Club, Shoreham, Sussex. Secretary, C. A. Boucher, Shoreham Aerodrome, Sussex.
Suffolk Aeroplane Club, Ipswich. Secretary, Maj. P. L. Holmes, The Aerodrome, Hadleigh, Suffolk.
Yorkshire Aeroplane Club, Sherburn-in-Elmet, Yorks. Secretary, Lieut.-Col. Walker, The Aerodrome, Sherburn-in-Elmet.

LONDON AEROPLANE CLUB

REPORT for week ending December 2.—Instructors: Captain V. H. Baker, M.C., A.F.C., Captain F. R. Matthews. Ground engineer: C. Humphreys.

The following machines were in commission during the week:—G-EBMP, G-EBXS. Total flying time for the week: 21 hrs. 20 mins. Dual instruction: 14 members received flying instruction, the time being 11 hrs. 10 mins., Solo flying: 11 members carried out solo flying, the time being 11 hrs. 10 mins.

First solo flights were made by D. T. Bennett and T. E. Rose Richards on Friday, November 30.

Christmas closing: Members are notified that the Club will close down for the Christmas holidays on Sunday evening, December 23, 1928, and re-open on Tuesday, January 1, 1929.

Christmas Staff Fund: The Christmas Fund for the Ground Staff has been opened. Individual subscriptions are limited to 10*s*.

Christmas Raffle: Members are reminded that there are still a few more tickets available (10*s*. each) for the D.H. Moth. Applications should be made to the Pilot Instructors at Stag Lane, or at 3, Clifford Street, W. 1.

Club premises: The building of the new hangar for the Club machines has now been completed, and we shall take possession during the week.

The erection of the Club rooms for the members is proceeding satisfactorily, and they should be available before Christmas. The Club will be fully licensed, and luncheons and teas will be served daily.

CINQUE PORTS FLYING CLUB

REPORT for week ending December 1.—Pilot instructor: Major H. G. Travers, D.S.C. Ground engineer: Mr. R. H. Wynn. Machines: Y.J. and N.N. Flying time for the week: 9 hrs. 25 mins. Dual instruction: Mr. Armstrong Payn, 3 hrs. 45 mins; Mr. Hamilton, 2 hrs. 45 mins.; Mr. Wanliss, 15 mins.; Mr. Harrison, 45 mins.; Lieut.-Comdr. Gubbins, R.N., 1 hr.; Mr. Clemetson, 45 mins. Total: 6 members, 9 hrs. 15 mins. Test flight: 10 mins.

On Sunday, November 25, no flying was possible, owing to the strong gale.

Mr. Armstrong Payn, a new member from Deal, commenced instruction during the week, and put in 3 hrs. 45 mins. He is progressing very well.

LANCASHIRE AERO CLUB

REPORT for week ending November 24.—Flying time, 10 hrs. 55 mins. Instruction (9), 3 hrs. 10 mins.; solo flights (14), 4 hrs. 25 mins.; passenger flights (3), 2 hrs. 30 mins.; tests (5), 50 mins.

Instruction: With Mr. Hall: Messrs. Davies, R. G. Chart, Russell, Weale, Ginger, Dewhurst, Fallon, Whitehouse. With Mr. Cantrill: Mr. Kay.

Machines in commission: MQ, PH, XD. New member: Mr. Russell. Soloists (under instruction): Mr. Kay. Pilots: Messrs. Meads, Michelson, Lacayo, Hall, R. F., Weale, Twemlow, Goodfellow, Nelson, D., Gort.

Passengers: With Mr. Cohen: Miss Briggs. With Mr. Hall: R. F. Davies, R. G. Russell.

REPORT for week ending December 1.—Flying time, 12 hrs. 45 mins.; instruction (16), 2 hrs. 30 mins.; solo flights (14), 8 hrs. 45 mins.; passenger flights (2), 35 mins.; tests (6), 55 mins.

Instruction: With Mr. Hall: Messrs. Eckersley, Whitehouse, Kay, R. G. Davies, Harrison, and Miss Emery. Machines in commission: XD, PH, QL, MQ.

Soloists (under instruction): Messrs. Eckersley, Kay.

Pilots: Messrs. Lacayo, Mills, Gort, Nelson, D., Twemlow Hall, Meads, Chapman, Dobson, Hall, R. F. Michelson, Harrison.

Passengers: With Mr. Cohen: Mrs. Cohen. With Mr. Hall, R. F. Halsall.

MIDLAND AERO CLUB

REPORT for week ending December 1.—The total flying time was 13 hrs. 35 mins. Dual, 8 hrs. 10 mins. Solo, 2 hrs. 30 mins. Passenger, 2 hrs. 30 mins. Test, 25 mins.

The following members were given dual instruction by Flt.-Lt. T. Rose, D.F.C., and Mr. W. H. Sutcliffe:—

C. R. W. Gleeson, C. T. Davis, R. L. Brinton, J. K. Morton, M. Blakeway, C. Blakeway, Mrs. Leigh Fermor.

"A" Pilots:—B. Evershed, C. W. Fellows, R. C. Baxter, R. L. Brinton, G. V. Perry, H. Toppin, J. Rowley, R. D. Bednell, S. H. Smith.

Soloists:—M. C. Wilks, J. K. Morton, F. D. Scott, W. L. Handley.

Passengers:—E. Hanson, N. C. Nokes, J. Gibbons.

On Wednesday, Flt.-Lt. T. Rose, D.F.C., flew L.W. to Stag Lane for renewal of the C. of A. This machine has now completed 1,000 hrs. on school work without mishap.

NORFOLK & NORWICH AERO CLUB

REPORT for week ending December 1.—Pilot instructor, B. Young. Ground engineer, A. Kirkby. Machines serviceable, two, QX. and ZW. Total flying time for week, 3 hrs. Dual instruction (4), 1 hr. 45 mins. "A" pilots (2), 1 hr. 15 mins.

Having survived the boredom of yet another week of thoroughly bad, uncivilised weather, we have nothing of interest to record, except that we have heard, on good authority, there is likely to be some good flying weather early in the New Year. Nothing dramatic has happened for weeks now, and not even the chance to get those "A" Licence tests and first solos done; however, we are trying to hope for the best in the near future.

SUFFOLK & EASTERN COUNTIES AEROPLANE CLUB

REPORT for week ending December 1.—Instructor, G. E. Lowdell, A.F.M. Ground engineers: "C," E. Mayhew; "A," G. Keeley. Three Blackburn "Bluebirds," RE, SZ and UH. Total flying time, 9 hrs. 35 mins. Four members were given dual instruction (2 hrs. 55 mins). Flight were made by two "A" Licence members (5 hrs. 20 mins). One trip was made on the Ipswich–Cambridge airway (50 mins). Five tests were made (30 mins). Mr. Garner, a new member, started dual instruction at Hadleigh during the week.

Mr. Schofield, an "A" Licence member, made two trips to Mousehold to visit our friends and neighbours, the Norfolk and Norwich Aero Club.

The weather has excelled itself, and for sheer vileness beat last week to a frazzle, club flying being possible only on Thursday and Saturday.

Cambridge Aeroplane Club.—Although we had a machine at Conington on Monday, the weather rendered flying out of the question. Although the weather was fine on Thursday for a spell, it was not considered fit to send a machine over to Cambridge.

Ipswich–Cambridge Airway.—Only one trip was made during the week, a machine flying from Cambridge to Hadleigh on Monday morning. By special request, passengers may book to Grantham on Mondays and Thursdays. The machine leaves Hadleigh at 10 a.m. to connect at Grantham with the Scotch Express, which leaves King's Cross at 10.5 a.m. From many parts of Suffolk it is necessary to travel to London overnight in order to catch this train. The alternative from Ipswich is a train leaving at 8 a.m. Thus the saving in time by air is anything from 16 to 2 hrs. The fare from Hadleigh to Grantham is £4 4*s.*, including Associate Membership of the club for one year.

YORKSHIRE AEROPLANE CLUB

REPORT for week ending December 1.—Pilot instructor, G. R. Beck. Ground engineer, R. Morris. Machines in commission, 3 (TB, SV, and RF). Flying time, 11 hrs. 40 mins. Instruction, 5 (2 hrs. 35 mins.). "A" Pilots, 7 (8 hrs. 55 mins.). Passengers, 1 (10 mins.).

Capt. Beck is doing his Reserve Course at Brough this week, but is managing to carry on the Club work as well.

Colonel Walker is progressing as favourably as can be expected.

FROM THE FLYING SCHOOLS

Brooklands School of Flying, Ltd., Brooklands Aerodrome

REPORT for week ending December 2.—Instructor, Capt. E. A. Jones. Ground engineers:—W. A. Watts, W. Hellon. Machines:—Renault Avros, G-EBVE, B-EBWJ. Flying time, 6 hrs. 15 mins. Pupils under instruction (8), 3 hrs. 40 mins. Soloists (3), 1 hr. "A" Pilots (3), 1 hr. 35 mins.

We welcome Messrs. W. L. Mummery, R. Beaton, Capt. Ellison.

We regret to say that Capt. H. D. Davis is temporarily out of action through illness, and has had to retire to a nursing home, but he is now showing great improvement.

We have been very lucky in securing the services of Capt. E. A. Jones, who is well known as a free lance joy-riding pilot, and who had the misfortune to have his machine blown to pieces during the gale a few days ago. This demonstrates the truth of that old saying that, "It's an ill wind that blows nobody good." If this misadventure had not occurred, we should not have secured his services.

OVERSEAS CLUBS

SINGAPORE FLYING CLUB

REPORT for week ending October 27.—Total flying time, 14 hrs. Solo, 3 hrs. 40 mins. Dual, 4 hrs. 40 mins. Joy rides, 4 hrs. 30 mins. Tests, 1 hr. 10 mins.

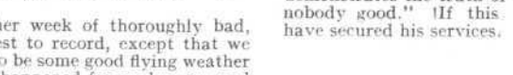
The small amount of flying time put in this week has been due to G-EBUJ still being out of commission, and to the fact that a top overhaul of the engine of G-EBUK was due. This meant that there was no flying at all on Tuesday and Wednesday, but the latter machine was flying again on the morning of October 25. The repairs to G-EBUJ are now almost complete, and we hope to have both machines once again in the air by the end of next week.

On the 21st instant, L. W. Learmount (an old pilot) did his first solo, after only 1 hr. 5 mins. dual, putting in the necessary 3 hrs. and completing his qualifying tests for "A" Licence the same day.

REPORT for week ending November 3.—Total flying time, 15 hrs. 10 mins. Solo, nil. Dual, 7 hrs. 50 mins. Air experience, 7 hrs. Tests, 20 mins.

Flying time has been low this week owing to unfavourable weather on several afternoons.

G-EBUJ is now in action again, having been tested after reassembly on 3rd instant. It is very gratifying to see both machines once more in the air together, and we now hope to be able to launch several *ab initio* soloists before very long.



STEEL AIRCRAFT AND AIR-COOLED AERO ENGINES

A PARTY of distinguished guests journeyed to Coventry on December 4 to inspect the vast aviation and motor-car works of Sir W. G. Armstrong-Whitworth Aircraft, Ltd., and Armstrong Siddeley Motors, Ltd., part of an organisation under the title of Armstrong Siddeley Development Co., which also now owns the aircraft organisation of Messrs. A. V. Roe and Co., Ltd. Upon arrival at the Whitley Aerodrome and works, an inspection of the shops was made under the helpful guidance of, amongst others, Maj. F. M. Green, chief engineer, and Mr. Hutchinson, the works manager, when the various operations in converting strip steel into spars and ribs and other parts that go to make up the complete units of the aeroplane were shown. The rolling and drawing machines are a wonder of ingenuity for their jobs. Following the rolling, the strips are hardened and tempered electrically by an ingenious process which has given results of a high degree of strength, ductility, and reliability. This operation and the assembly of the formed strip into complete spars and ribs and the erection of these into complete units was a feature much appreciated by the visitors. Throughout the circuit of the "miles" of machine tools, jigs, etc., each item had an absorbing interest of its own, and one felt that really to grasp the wonderful organisation of these shops and their resultant output a visit of nearer a month than a few hours was essential.

A comparatively recent installation at the works is a wind-tunnel, which is proving itself a very valuable asset. A small demonstration which was given was very convincing as to the inadvisability of attaching minor gadgets to machines when air resistance is a matter of moment.

Subsequent to the inspection of the works, Mr. J. D. Siddeley, C.B.E., who controls this great organisation, mentioned that the works were engineering works as against an ordinary aeroplane factory, and that they were proud of their record in having pinned their faith to steel. Not only had their system been adopted by the Air Ministry, but they had had the honour of passing on their experiences to some of the leaders in the aircraft industry. They had found that the combination of aircraft and engine production was very happy, both sides being able to co-operate in development, and he said they were on the eve of turning out steel aircraft on a basis practically as cheap as in wood. As a result of their co-operation they were now in a position, when called upon, subject to orders and the supply of material, to turn out 25 to 30 aero engines per week.

Altogether the visit was exceptionally interesting and instructive, and we hope shortly to give a more detailed résumé of some of the more important construction items.

Amongst the visitors were the following foreign representatives: Lieut. S. A. Casares (Argentine), Lieut.-Col. H. Nerincx (Belgium), Sqdn.-Ldr. A. Kubita and Lieut.-Comdr. Falconakis (Czechoslovakia), Monsieur R. A. Mollerson (Esthonia), Lieut. De Vaisseau Sala (France), Maj. S. A. Beldy (Hungary), Gen. R. Verduzzio (Italy), Col. the Marquis Mayedo, C.V.O., M.C., Lieut.-Col. J. Tozawat and Capt. K. Shiozawa (Japan), Monsieur L. Ekis and Capt. Kandie (Latvia), Dr. A. Reyes-Guerra (Salvador), Maj. H. R. Harmon (U.S.A).

The Air Ministry was represented by Maj. A. B. Boyle, C.B.E., M.C., and Mr. F. P. Scott, of A. V. Roe and Co., was also present. The visitors were received and helpfully piloted round the aviation and motor car shops, etc., by Capt. C. D. Siddeley, Mr. E. H. Siddeley, Maj. F. M. Green (chief engineer), Mr. Hutchinson (works manager), Mr. S. W. Hiscocks, Capt. J. C. Briggs, Maj. W. G. McMinnies, and Maj. B. W. Shilson.

HONOURING SQDR.-LDR. "BERT" HINKLER

SQDR.-LDR. "BERT" HINKLER, A.F.C., D.S.M., was honoured by Sir Charles Cheers Wakefield, C.B.E., LL.D., at dinner at the Savoy Hotel, on November 28. Before his opening speech Sir Charles Wakefield read a telegram from Sir Samuel Hoare, who regretted he could not attend, owing to being already engaged for the evening. But he asked Sir Charles to convey his congratulations to Hinkler upon the brilliant flight. It marked another stage, he wrote, in the pioneer work that was being carried out by the Royal Air Force and civilian fliers for developing Imperial communications. Sir Charles then said that it was his privilege to introduce Sqdr.-Ldr. Hinkler—better and affectionately known to most of them as Captain "Bert" Hinkler—who was their guest of honour that night. He was very gratified that he was able to persuade Sqdr.-Ldr. Hinkler to permit him on their behalf, and on behalf of the far wider public outside, to offer him that expression of their admiration.

One of the most remarkable features of his flight was its extreme modesty—one might even use the word "stealth." For very few, even of his friends, knew how heroically ambitious was his project until he was well on the way to the Antipodes. He departed in silence and had returned

In a sense, they in England had had a real share in Sqdr.-Ldr. Hinkler's achievement, for the machine which carried him day after day so steadily and successfully was British in every respect—in material, in workmanship, and in design. They had a right to be proud of that, even though it was as a personal triumph that that flight would be remembered. Before he called upon Air Vice-Marshal Sir Sefton Brancker to propose the toast of the evening, concluded Sir Charles Wakefield, he would like, he said, to offer to Mrs. Hinkler, a souvenir of her husband's splendid flight. Their tribute was almost as much to her as to him, for her faith and encouragement were surely his strength and support, and she justly shared in his triumph. Might he wish them both every happiness. Sir Charles Wakefield then presented Mrs. Hinkler a platinum and diamond brooch, showing a beautiful model of a kangaroo leaping across the globe from England to Australia, with dates in platinum, of the wonderful flight.

Air Vice-Marshal Sir Sefton Brancker, Director of Civil Aviation, then rose and in proposing the toast to Sqdr.-Ldr. Hinkler, he gave a résumé of the aviator's career and concluded with the greatly applauded statement that he was a born airman, a brilliant pilot and an expert navigator.

AT THE SIR CHARLES WAKEFIELD-HINKLER DINNER. From left to right: Air Vice-Marshal Sir Sefton Brancker, Lady Wakefield, Sqdr.-Ldr. "Bert" Hinkler, R.A.A.F., Sir Charles Wakefield, Mrs. Hinkler.

equally unobtrusively. Thus, the British public had had no real opportunity of showing its appreciation of a truly grand achievement. That it did so regard Hinkler and his wonderful solitary journey he was very confident, and the really representative gathering there was ample assurance of that fact.

Their kinsmen in Australia rightly looked upon Sqdr.-Ldr. Hinkler's fifteen and-a-half days' flight as a national event. He flew home and from his people he received a rapturous welcome which he was never likely to forget. Circumstances had deprived them of the opportunity of evincing the same widespread enthusiasm, but they prized his courageous exploit just as sincerely and keenly in the Motherland. Englishmen and women were more deeply imbued with the Imperial spirit than ever before.

Certainly we took equal pride in any outstanding example of bold endeavour by any citizen of the Empire. They were with their Australian brethren in spirit during that memorable progress from Port Darwin to Bunderberg; and that night they offered a heartfelt tribute to Sqdr.-Ldr. Hinkler. He had given them a glimpse of the world of to-morrow, when men would finally have achieved the freedom of the air. He had done more than that—he had rekindled the boyish, adventurous spirit in all their hearts; and added one more to the heroic legends of their race. For all that they thanked him.

Sqdr.-Ldr. Hinkler responded and gave a rapid review of the several outstanding features of his flight—in a manner covering the recent story which was printed in FLIGHT for November 22. He said he felt he was well supplemented on his trip in having the right tools—a British aircraft, fitted throughout with British equipment. Spectacular records or big prizes were usually the reasons for great flights, but in his case his object was to go home to Australia to see his people.

He was in a hurry, and the boat service took so long. Flying was not only his business, but his hobby, and having in his possession a fair example of modern British light aircraft, for what better purpose could he use it? The *pièce de résistance* of his journey was his arrival at Rome. He had expected to find modern arrangements for night landing, but after flying for some hours in the darkness he tried to suggest that he wanted to land. When he was close to the hangars a flare nearly set fire to the machine.

Throughout his speech, Sqdr.-Ldr. Hinkler, as usual, dealt with each part shortly and briskly—generally with a subtle touch of humour, exemplified by his reference to his tyres, which he said were splendid and that just before he left this country London air was pumped into them. He did not have a puncture until he reached Australia. Then English air mixed with Australian air, and the next morning there was a fog!

Following the airman's speech the toast to The Common-

wealth of Australia was proposed by Sir Harry Brittain in an invigorating speech, with the response being in the hands of the Hon. Sir George Fuller, K.C.M.G., and Maj.-Gen. the Hon. Sir Newton J. Moore, K.C.M.G.

The Hon. Sir Arthur Stanley then proposed the toast "Aviation and the Empire," and after a brief reference to the death of a very dear friend, Frank Hedges Butler, referred to Col. The Master of Sempill, President of the Royal Aeronautical Society, who had done a great deal for aviation, and with whose name he coupled the toast.

Col. The Master of Sempill, in replying, said that Sir Arthur, perhaps more than any other individual, was responsible for the success of the motor car business today. He had fought its battles from the very earliest times: the fact that there was roughly being put on the road something over 5,000 cars a week was due to him, and now he could do the same for aeroplanes by putting the same number per week into the air.

The names of many famous Australians had been mentioned, continued The Master of Sempill, but one or two had been forgotten. Might he refer to the late Mr. Hawker—one of the first Australian flyers and one of the best pilots the world had ever known. In addition, Sir Hubert Wilkins.

Also, from the point of view of the Royal Australian Air Force flight, to Gobel. He then referred to Maj. Norman Brearley, who, he said, started Western Australian Airways some years ago and now he was operating that air line running something like 1,500 miles or more. He would be operating an extension running something over 2,000 miles, due to the fact that the Australian Government was spending an additional £2,000,000, greater assistance than was given to our home industry. It was up to us further to induce, by the best means we could, the Government to put more support into aviation.

Maj. Norman Brearley in reply, said that some of the things they had done in Western Australia had come about because of the things that had been done by such men as "Bert" Hinkler. They had been carrying on with a team of pilots trained during the war. Most of them British stock, all of them British citizens. Speaking of British equipment, he said that he admired it and loved it. The day was coming when the subsidy would be so reduced that the point would be reached when it would be entirely withdrawn. The speeches concluded with the chairman's toast proposed by the Right Hon. Charles A. McCurdy, K.C., briefly acknowledged by Sir Charles Wakefield. Amongst those present were :—

Air Vice-Marshal Sir John Higgins, Capt. F. E. Guest, Brig.-Gen. P. R. C. Groves, Air Vice-Marshal Sir Vyell Vyvyan, Rear Admiral Murray Sueter, Maj. Gen. Sir Newton J. Moore, the Hon. Sir G. W. Fuller, the Hon. W. C. Angwin, the Hon. Sir Henry Barwell, the Hon. Sir J. D. Connolly, Lieut.-Col. Sir A. Burgoyne, Lieut.-Col. Sir Henry Galway, Sir Edward Iliffe, Sir Francis K. McClean, Lieut.-Col. R. Eccles Snowden, Lieut.-Col. N. G. Thwaites, Sir Alfred Robbins, Mr. O. Short, Mr. A. V. Roe, Capt. G. de Havilland, Mr. Handley Page, Mr. C. R. Fairey, Mr. G. G. Parnall, Mr. F. E. N. St. Barbe, Capt. C. C. Walker, Capt. H. Broad, Mr. H. T. Vane, Col. Warwick Wright, Mr. J. D. Siddeley, Mr. F. Sigrist, Maj. G. E. Woods Humphery, Mr. W. Lappin, Mr. H. Martin, Mr. H. H. Morris, Sir Robert Gower, Lieut.-Col. M. O. Darby, Lieut.-Col. L. F. R. Fell, Sqdr.-Com. J. Bird, Capt. N. Blackburn, Mr. C. Grahame White, Maj. F. Halford, Mr. A. H. R. Fedden, Lieut.-Col. Ivo Edwards, Mr. S. F. Edge, Mr. T. St. J. Plevins, Capt. F. R. Walker and Capt. H. S. Leverton.

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THE ROYAL AIR FORCE

London Gazette, November 27, 1928.

General Duties Branch

The following are granted permanent commns. in ranks stated (Oct. 1).—Flight-Lieut. D. W. Clappen, Flight-Lieut. D. F. Lucking, Flying Officer D. D. M. Eastwood.

Wing Commander O. T. Boyd, O.B.E., M.C., A.F.C., is seconded for three years' duty at the Staff College, Camberley (Jan. 22). (Substituted for *Gazette*, March 27.) Flying Officer H. A. M. Weir is transferred to Reserve, Class C. (Nov. 15); Lieut.-Comdr. R. St. A. Malleson, R.N., Flight-Lieut., R.A.F., ceases to be attached to the R.A.F. on return to Naval duty (Nov. 26); Pilot Officer on probation H. Cook resigns his short-service commn. (Nov. 16); the short-service commn. of Pilot Officer on probation J. L. Smallwood is terminated on cessation of duty (Nov. 16.)

Stores Branch

Pilot Officer on probation O. D. Allerton is confirmed in rank and promoted to rank of Flying Officer (Oct. 15).

Medical Branch

Flying Officer R. A. W. Kerr, M.B., is promoted to rank of Flight-Lieut. (Nov. 22); Flight-Lieut. T. J. X. Canton, M.B., is promoted to rank of Squadron Leader (Nov. 25); Flight-Lieut. A. H. Mills (Temp. Capt., General List, Army, Dental Surgeon) relinquishes his temp. commn. on completion of service (Nov. 11).

RESERVE OF AIR FORCE OFFICERS

General Duties Branch

The following officers on probation are confirmed in rank :—Class A.—Flying Officer C. Byron, Flying Officer A. W. Simon (Nov. 22). Class AA (ii). —Pilot Officer T. S. Dykes (Nov. 21).

Special Reserve.—Pilot Officer N. D. Wardrop, Pilot Officer L. V. G. Barrow (Sept. 26).

The following officers are transferred from Class A to Class C :—Flying Officer G. Clapham, A.F.C. (Nov. 17); Pilot Officer A. Barron (April 28). The following Flying Officers relinquish their commns. on completion of service :—C. G. Bloomer (Nov. 18); C. B. Bond (Nov. 19). The following Flying Officers relinquish their commns. on completion of service, and are permitted to retain their rank :—J. A. H. Savage (Oct. 23); G. R. B. Smyth (Oct. 24). *Gazette* Nov. 13 concerning Flight-Lieut. H. V. Stammers, D.F.C., is cancelled.

Medical Branch

Flying Officer R. G. J. McCullagh relinquishes his commn. on completion of service (Oct. 4).

AUXILIARY AIR FORCE

General Duties Branch

No. 602 City of London (Bombing) Squadron.—Pilot Officer C. A. S. Parker is seconded for a further period of one year (Dec. 8).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified :—

General Duties Branch

Group Captain P. H. L. Playfair, M.C., to H.Q., Transjordan and Palestine, pending taking over command, 15.11.28.

Squadron Leaders: N. C. Spratt, O.B.E., to R.A.F., Depot, Uxbridge, 4.11.28. C. O. F. Modin, D.S.C., to R.A.F. Depot, Uxbridge, 14.11.28. W. Sowrey, D.F.C., A.F.C., to H.Q., Air Defence of Gt. Britain, Uxbridge, 3.12.28.

Flight Lieutenants: C. H. Stilwell, to No. 2 Sqdn., Manston, 6.12.28. A. McR. Moffatt, to Armament and Gunnery Sch., Eastchurch, 26.10.28. E. D. Davis, to Armament and Gunnery Sch., Eastchurch, instead of to H.Q., Wessex Bombing Area, as previously notified. J. Marsden, to H.Q., Air Defence of Gt. Britain, Uxbridge, 28.11.28. A. P. Revington, to H.Q., Iraq Command, 22.11.28. E. F. Turner, to Air Ministry (Signals Branch), 1.12.28. E. C. Delamain, M.C., to No. 3 Flying Training Sch., Grantham, 19.11.28.

Flying Officers: R. H. W. Empson, to Armament and Gunnery Sch., Eastchurch, 20.11.28. R. A. Whyte, to No. 5 Flying Training Sch., Sealand, 10.11.28. A. E. Haes, to No. 101 Sqdn., Bircham Newton, 9.11.28. S. Pritchard-Barrett, to No. 3 Flying Training Sch., Grantham, 28.12.28. G. L. Gandy, to No. 482 Flight, Cattewater, 10.11.28. F. E. Nuttall, to R.A.F. Station, Duxford, 15.11.28. G. N. Pilcher, to No. 8 Sqdn., Aden Command, 24.11.28. J. S. Wilkins, to R.A.F. Depot, Middle East, 27.11.28. C. J. Stone to Elect. and Wireless Sch., Flowerdown, 23.12.28. D. S. Brookes, to R.A.F. Depot, Middle East, 27.11.28. P. J. Bett, to No. 6 Sqdn., Iraq, 27.11.28. A. W. H. Nelson, to R.A.F. Depot, Uxbridge, 1.12.28.

Pilot Officers: J. F. X. McKenna, E. M. Thomas, R. S. Collins, P. Kinsey, and P. G. Thomson, to No. 3 Flying Training Sch., Grantham, 7.11.28. J. L. Smallwood, to R.A.F. Depot, Uxbridge, 28.10.28. G. Wood, to No 30 Sqdn., Iraq, 30.10.28. R. F. J. Doran Webb, to R.A.F. Depot, Uxbridge, 4.11.28.

Stores Branch

Flight Lieutenants: H. E. T. Crocker, to No. 1 Stores Depot, Kidbrooke, 22.11.28. R. G. Gore, to H.Q., Transjordan and Palestine, 14.11.28.

Flying Officer C. I. Fry, to No. 3 Stores Depot, Milton, 22.11.28.

Accountant Branch

Flying Officer D. F. A. Clarke, to No. 2 Armoured Car Coy., Middle East, 18.11.28.

Medical Branch

Squadron Leader A. Briscoe, M.B., to R.A.F. British Hospital, Aden Command, 1.11.28.

Flight Lieutenant J. Hutchieson, M.B., to No. 5 Sqdn., India, instead of to H.Q., India, as previously notified.

Medical Branch

Flight Lieutenant (Dental) A. R. H. Bennett, to R.A.F. Hospital, Cranwell, on appointment to a Temp. Commn., 12.11.28.

Flight Lieutenant (O.-Masir. Medical) F. W. Goodread, to H.Q., Inland Area, Stanmore, instead of to H.Q., Air Defence of Gt. Britain, as previously notified.

Chaplains Branch

Revd. W. P. Hughes, to H.Q., Iraq, 30.10.28.

NAVAL APPOINTMENTS

The following appointments were made by the Admiralty on December 1 :—

Lieuts. (Flying Officers, R.A.F.).—D. M. L. Neame, to *Furious*; and G. R. F. T. Cooper, to *Argus*.

CORRESPONDENCE

THE "MOTOR CYCLE OF THE AIR"

[2177] We note with interest your article about Single-Seater Light Aeroplanes.

We are in a position to supply complete drawings for a light aeroplane to take an A.B.C. Scorpion engine to any persons who wish to construct such a machine themselves.

The aeroplane is a low-wing monoplane, single-seater, with a detachable wing. The machine has been designed for our own purposes by Captain K. N. Pearson, late of Messrs. Hawkers, etc., and it is an exceptionally cheap and practical machine to construct.

We are just commencing the manufacture of such a machine and hope to complete it within three months. We have a special arrangement with the makers of the A.B.C. engine to supply us with engines for this machine. The retail price of the engine is £127 10s. Therefore, the price of the complete machine would work out to £325, and if any of your readers are interested we shall be pleased to give them further particulars either as to supplying them with the complete machines or the drawings, which will be supplied on the condition that the licence is to construct one machine only.

LT./COL. G. L. P. HENDERSON

Henderson Flying School, Ltd.

November 30, 1928.

[2178] Whilst noting with interest contents of your article in this week's issue, headed "The Motor Cycle of the Air," we are afraid that your sentence regarding the A.B.C. "Scorpion," reading:

> "and could, we believe, be put into production at any moment,"

will be rather misleading to your readers, as this particular engine has *been* in production for some time past now, and is the subject of active business in Germany, France, Poland, Australia, etc., and we should be glad if you could correct any false impression that may be given, in your next issue.

T. A. DENNIS,

Managing Director

A.B.C. Motors, Ltd.

December 1, 1928.

* * * *

Aircraft Wanted in Switzerland

THE British Legation at Berne reports that a Co-operative Society is being formed locally and is likely to be on the market shortly for aeroplanes. Firms desirous of offering aircraft of British manufacture can obtain further particulars upon application to the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1. (Reference number AX. 7214 should be quoted.)

British Aero Engines Reliability

IT is interesting to note, as showing the remarkable reliability of the Napier aero engine, that the "Lion" engines used by Imperial Airways on their Continental Service in 1925 were overhauled every 250 hrs. In 1926 this had been increased to 300 hrs. and in September, 1927, the time between overhaul of engines was as much as 325 hrs. Many of the engines used by Imperial Airways exceed this period, one having run for 478 hrs. (47,800 miles) before being dismantled. When one considers the strenuous work of these engines on the Continental services, day in and day out, and realises they have all been in use for a number of years, the majority having 2,000 hrs. (200,000 miles) total flying to their credit and some well over 3,000 hrs. (300,000 miles), it will be agreed that the amazing reliability and long life of the Napier "Lion" aero engine has been proved beyond doubt.

Bert Hinkler's Good Fairey

THE Fairey Aviation Co., Ltd., of Hayes, have received from Mr. Bert Hinkler, the following letter, which we think may be of interest to our readers:—

"I have dispatched to you by passenger train the metal airscrew which was used on my record flight from England to Australia. This has been returned for your inspection and I shall be glad to have your report on its condition. The test should prove of mutual interest, particularly as the propeller has been exposed to extreme variations of climate, from flying through heavy tropical rains and the dry heat of the desert, to snowstorms. On other occasions when taking off under bush surroundings the blades have mowed a track through the tall grass and brushwood. Although the airscrew was one of the items about which I had no doubt whatever, and at the conclusion of my tour of Australia with a total of over 35,000 miles, was running as smoothly as on the day I set out from England, I should welcome your expert examination and report. Congratulating you on an excellent production, yours faithfully, B. Hinkler."

IN PARLIAMENT

Royal Air Force Recruitment

SIR S. HOARE, on November 27, in reply to Mr. Lunn, said 8,356 men presented themselves for recruitment and 2,171 boys sat for education test during 1927. Of these, 2,453 men and 1,030 boys were finally accepted, and 4,042 men and 192 boys were rejected on medical grounds.

Civil Aviation Statistics

SIR P. SASSOON, on November 28, in reply to Lieut.-Col. Gault, said the number of passenger aeroplanes which have current certificates of airworthiness, are owned by British companies, and are operated in or from Great Britain on air transport work, taxi work or pleasure flights, is 52. 109,569 passengers were reported as carried by these companies in this country or between this country and the Continent in 1927; the average for three years has been 95,316. There are in this country 85 licensed civil aerodromes and, in addition, 43 Royal Air Force aerodromes available in emergency.

Lieut.-Col. Gault: Does not the hon. Baronet think that greater help and encouragement would be given to civil aviation in the United Kingdom by providing the necessary means for aircraft by a more comprehensive system of aerodromes throughout the country?

Sir P. Sassoon: We are doing our best. We ask the great towns to introduce aerodromes.

England-India Air Services

MR. MALONE asked the Secretary of State for Air whether negotiations had taken place with the Sultan of Muscat, with the Sultan of Nejd, and with the Sultan of Koweit, in regard to the establishment of air bases within their territories in connection with the proposed weekly air service between London and Karachi; and, if so, what was the result of the negotiations?

Sir S. Hoare: The recent settlement of the questions which had been outstanding with the Persian Government in this matter has rendered it unnecessary at the present time to seek for any alternative route for the Imperial Airways service to India.

* * * *

PUBLICATIONS RECEIVED

Practical Flying: A Training Manual for Airplane Pilots. By Byron Q. Jones. The Ronald Press Co., 15, East 26th Street, New York. Price $3·00.

Achievements of 1928. C. C. Wakefield and Co., Ltd., Wakefield House, Cheapside, London, E.C.2.

Aeroplanes, Seaplanes and Aero Engines. By Capt. P. H. Sumner. Crosby Lockwood and Son, 7, Stationers' Hall Court, London, E.C.4. Price 25s. net.

Cours de Physique. Part III. Aérologie et Aérodynamique. By E. Rothé. Gauthier-Villars et Cie., 55, Quai des Grands-Augustins, Paris. Price 50 fr.

The Air Pilot Monthly Supplement. No. 48. *Oct.*, 1928. Air Ministry, Kingsway, London, W.C.2.

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AERONAUTICAL PATENT SPECIFICATIONS

(*Abbreviations*: Cyl. = cylinder; i.c. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.)

APPLIED FOR IN 1927

Published December 6, 1928

12,074. J. F. N. CRAIG. Rotary engines. (300,215.)
20,487. SIEMENS-SCHUCKERTWERKE A.-G. Working of engines for the propulsion of aircraft. (275,625.)
20,596. F. W. DAVIS and CLEVELAND BRIDGE AND ENGINEERING CO., LTD. Airship mooring-masts. (300,161.)
20,923. J. ZEITLIN. I.c. engines. (300,225.)
21,881. F. H. ROYCE. Electrical turning-gear for starting i.c. engines. (300,320.)
24,342. E. A. FOUNDS. Aeroplane kites. (279,051.)
27,772. C. M. JONES. Fire-extinguishers for aircraft. (300,374.)
28,652. M. LOBELLE. Radiators for aeroplanes. (300,382.)

APPLIED FOR IN 1928

Published December 6, 1928

3,183. O. KRELL. Mooring arrangements for airships. (300,431.)
7,495. H. and M. FARMAN. Driving and clutching device for air-compressors of aeroplane engines. (288,173.)
7,963. A. ROHRBACH. Floating-bodies for seaplanes. (287,176.)

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